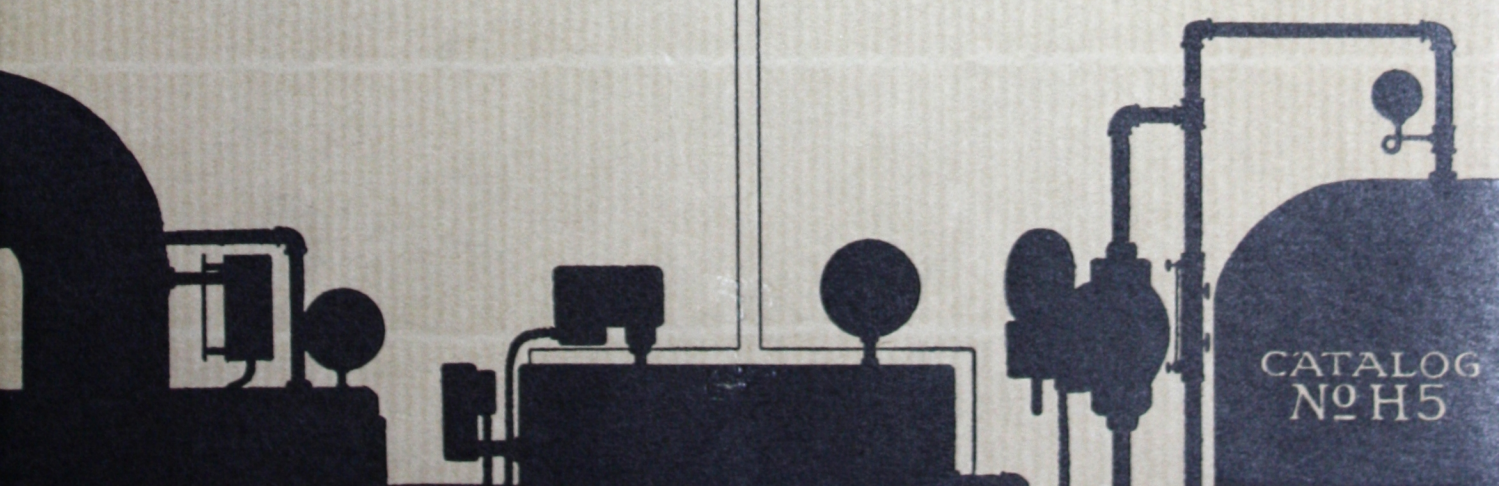
MERCOID

CONTROLS

FOR HEATING EQUIPMENT



CATALOG
Nº H5

COMPLETE AUTOMATIC CONTROLS FOR DOMESTIC AND INDUSTRIAL HEATING EQUIPMENT

Heating controlers

MERCOID

CATALOG
No H5
1929

COMBINED INDUSTRIES
THE FEDERAL GAUGE COMPANY
ARCLESS CONTACT COMPANY

THE MERCOID CORPORATION
564 WEST ADAMS STREET
Chicago, Illinois, U.S.A.

25 CHURCH STREET
New York, N. Y.

THE MONADNOCK,
San Francisco, Calif.

Cable Address: "MERCOID" *Chicago*

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NOTE—When in doubt as to what control is most suitable for the purpose, send us detailed information regarding your problem. Our engineering department is at your service.

Trade MERCOID Mark

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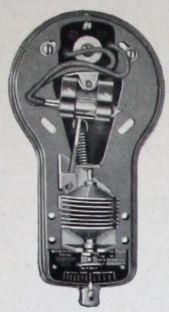
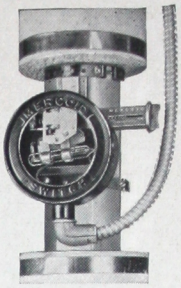


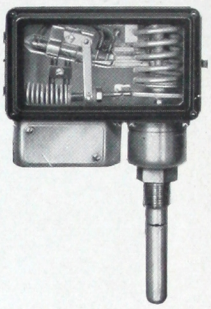


MERCOID

CONTROLS

DURING its years of serving the heating industry, the Mercoid organization has consistently endeavored to provide the latest designs and most improved types of wholly dependable instruments that engineering skill can develop.

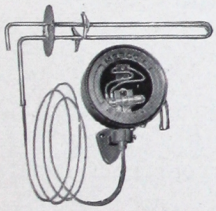
The design and construction of Mercoid controls insure ease of installation and satisfactory performance, with freedom from service expense and replacements. The advantages of the Mercoid 2-wire system of direct control are recognized, as manifested by an ever-increasing demand. Mercoids are going to every part of the World where automatic equipment is in use, and in ever-increasing volume.



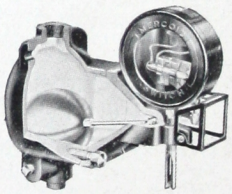
Mercoid controls are designed for automatic or semi-automatic direct control of motors where the normal working load does not exceed 10 amperes at 110 volts or 5 amperes at 220 volts, for either A. C. or D. C. As a pilot switch where used in series with the proper starting switch, the Mercoid will automatically control motors of the largest size. No transformers are required for voltages up to 220.

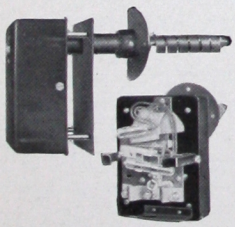
MERCOID CONTROLS are listed as standard by the Underwriters' Laboratories, Incorporated.

All types of Mercoid controls employ a sealed glass tube, containing inert gases and mercury, for completing or opening circuits. There are no exposed conducting surfaces, therefore, the possibility of open arcing, oxidation or corrosion is eliminated.

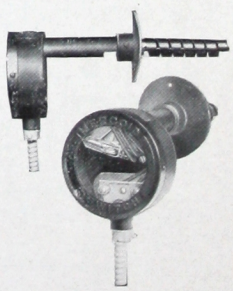


Special attention is directed to the snap action movement employed in all Mercoid instruments, to actuate the Mercoid tube, in completing or breaking circuits. This movement is locked at both the "on" and "off" points, preventing premature or erratic operation as the result of a jar or mechanical vibration.





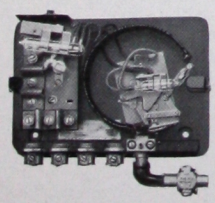
The various controls illustrated on this page and fully described on succeeding pages, are representative of the general scope of the instruments embraced in the Mercoid System of Direct Control.

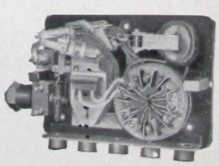


PATENTS ISSUED

1439975	1612777	1644935	1662122	1686276
1473120	1614621	1648389	1674051	1686286
1521638	1636191	1648390	1674601	1687842
1561474	1640869	1648414	1675897	1690689
1588380	1642932	1657681	1675898	1691016
1598874	1642937	1658013	1681421	1697986

OTHERS PENDING





The Mercoid Thermostat

For Control of Air Temperature

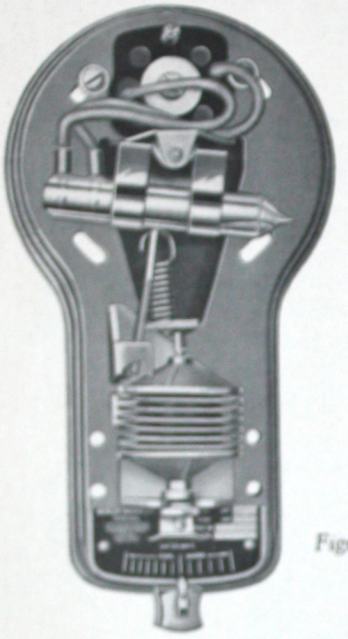


Figure 21

SALIENT FEATURES:

Hermetically sealed mercury tube.
Quick snap action.
Machined bearing points.
Non-deteriorating metal bellows.
Convenient temperature indicator.

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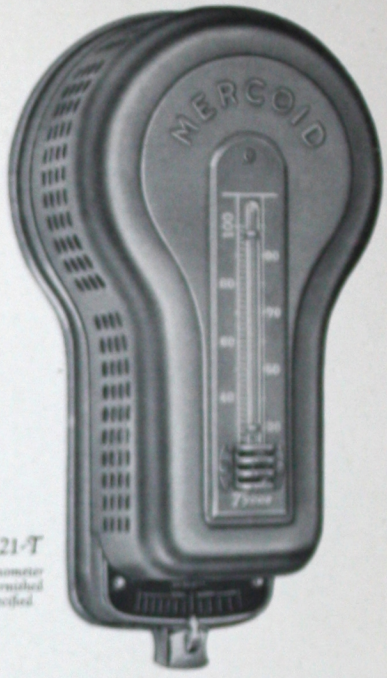

Figure 21-T
With thermometer on cover furnished where specified.

FIGURE 21

THE Mercoid Thermostat is designed for automatic temperature control of oil burners, unit heaters and for other applications where it is desired to control an electric circuit through changes in air temperature.

Equipped with Figure 3 Mercoid tube, for direct control of motors where the normal working loads do not exceed 10 amperes at 110 volts or 5 amperes at 220 volts, A. C. or D. C.

As a pilot switch, where used in series with the proper starting switch, the Mercoid will automatically control motors of the largest size.

SPECIAL APPLICATIONS

Positive and reliable performance of warm air heating systems, equipped with booster fans, assured by the use of the Mercoid Thermostat.

For buildings heated by central station steam, the Mercoid Thermostat, in conjunction with Motor or Solenoid Valves, provides an accurate means of controlling room temperature.

Dual control of unit heaters obtained where the Mercoid Thermostat is used in combination with Mercoid Fig. 31 Pressure Control (page 6)

STANDARD RANGE:

56° F. to 80° F. with 2° F. operating differential.

FOR UNIT HEATER APPLICATION, STANDARD RANGE:

38° F. to 60° F. with 4° F. operating differential.

See opposite page for list prices.

MERCOID System of DIRECT CONTROL

The Mercoid Thermostat *(Cont'd)*

For Control of Air Temperature

Figure 21-LD
With locking device

Distinctive Appearance
Positive Operation
Accurate Control
Reliable Performance

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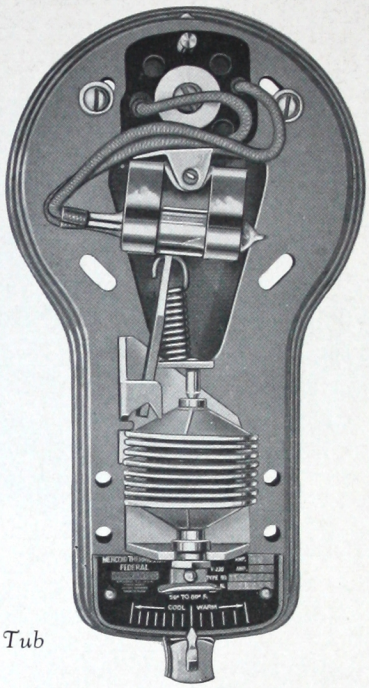

Figure 21-A
With 3-ampere Mercoid Tub

FIGURE 21-LD

This equipment is especially made to safeguard against tampering, on installations where it is desirable that the setting of the indicator on the scale shall not be changed. Recommended for theatres and also for factories, apartment or office buildings, in connection with oil burners, unit heaters or booster fan equipment.

Locking feature regularly furnished with key.

FIGURE 21-A

Identical in style and design with Figure 21, except that it is equipped with a Figure 17 Mercoid tube for application where current requirements do not exceed 3 amperes at 110 volts, A. C. or D. C.

We especially recommend this instrument for use in connection with No. 682 Solenoid Valve (see page 17) for control of high and low flame type burners.

As a Pilot switch, where used in series with the proper starting switch, the Mercoid will automatically control motors of the largest size.

LIST PRICES:	Figure 21	Figure 21-A	Figure 21-LD
Single Pole	$30.00	$27.00	$32.00
Two Pole	36.00	30.00	38.00
Two Circuit	36.00	30.00	38.00
For special range, add	4.00	4.00	4.00

Where thermometer is specified on any of above types, add $2.00.

Dimensions of instrument, 7⅝x4 inches wide.

Shipping Weight 3 lbs. 1 oz.

Until the advent of the Mercoid Thermostat there was not a successful room thermostat on the market which employed the combination of a mercury switch and a metal bellows.

The Mercoid Thermostat is the pioneer in its field and is fully perfected. It is the only instrument of its kind with a background of proven performance over a long period of years.

Imitations which might avoid pending and issued patents must lack the essential features to secure accurate, positive and reliable operation. *There is but one "MERCOID".* Its leadership is unquestioned.

The Mercoid Pressure Control

For Steam Boilers

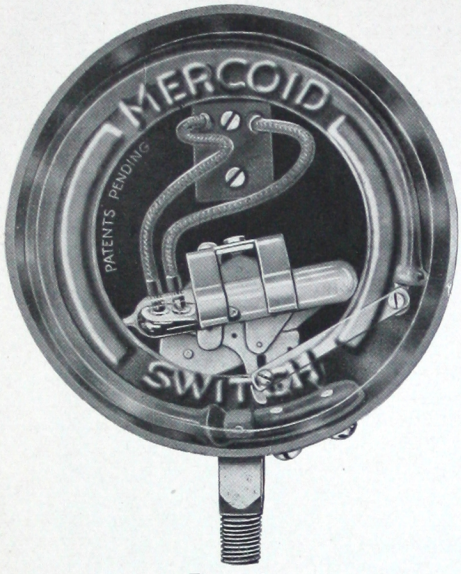

Figure 31

STANDARD RANGE:

All types

1 lb. to 4 lbs.
Adjustable up to
7 lbs. to 10 lbs.

For available ranges, other than standard, see next page.

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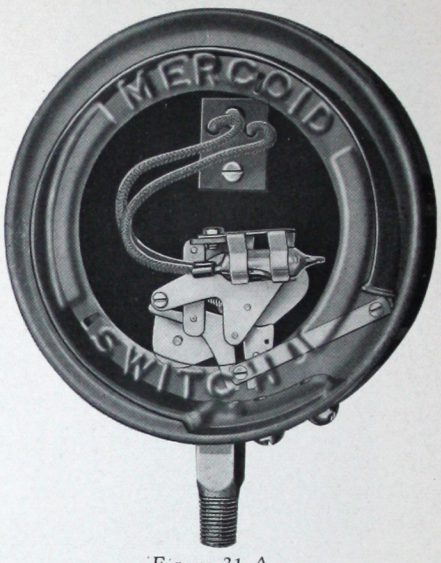

Figure 31-A

FIGURE 31

MERCOID Automatic Pressure type Boiler Control for all steam units.

A positive safety limiting device—widely used as a boiler control with automatic oil burners and automatic coal-burning equipment.

Regularly furnished with Figure 3 Mercoid tube and snap action movement. Actuated by specially-designed Bourdon tube, of great strength and elasticity. The snap action movement is locked in position at both the cut-in and cut-out points.

No relay or starting switch is necessary where the normal working loads do not exceed 10 amperes at 110 volts or 5 amperes at 220 volts, A. C. or D. C.

FIGURE 31-A

FOR application where the current requirements do not exceed three amperes at 110 volts, A. C. or D. C.

Of the same style and design as Figure 31 pressure control except that it is equipped with Figure 17 three ampere Mercoid tube.

All types of Mercoid pressure controls furnished with ¼" threaded connections.

Steam Switches must be installed with siphons. A "pigtail" siphon is included with each steam control.

Both types furnished with improved outlet box. See next page.

As a pilot switch, where used in series with the proper starting switch, the Mercoid will automatically control motors of the largest size.

NOTE: Figures 31 or 31-A can be furnished for semi-automatic operation to cut out on either a rise or drop in pressure, as specified, equipped with manual reset for resuming operation.

The Mercoid Pressure Control

For Steam Boilers (Cont'd)

Figure 31-L

STANDARD RANGE

(all types)

1 lb. to 4 lbs.

Adjustable up to

7 lbs. to 10 lbs.

Available ranges, other than standard, shown at bottom of this page.

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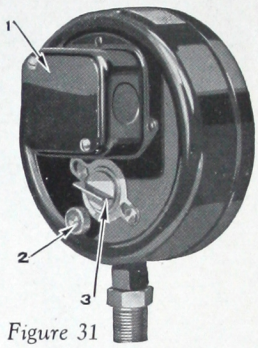

Figure 31

FIGURE 31-L

for 3-wire or low voltage

Designed for 3-wire or low voltage requirements, with one each, red, white and blue binding posts. Will handle currents not in excess of one ampere at 110 volts, A. C. or D. C.

On automatic oil burner installations requiring a 3-wire or low voltage hookup, will eliminate corrosion and arcing encountered with open contact switches.

ADJUSTMENTS:

All types have a simple adjustment for raising or lowering the cut-in and cut-out points.

1. Improved type outlet box with outside screws for making quick electrical connections. (Not used on low voltage types.)
2. Knurled hand reset button on both fully automatic and semi-automatic types of instruments.
3. Hand adjustment for raising or lowering the boiler control setting.

Standard range 1 to 4 lbs. adjustable 7 to 10 lbs.

Available ranges other than Standard:

Setting	Adjustable
0 to 2 lbs.	1 to 3 lbs.
½ to 3 lbs.	2 to 4½ lbs.
5 to 8 lbs.	9 to 12 lbs.
5 to 10 lbs.	10 to 15 lbs.

Where furnished for pressures above 15 lbs. and up to 25 lbs. the minimum operating differential is 5 lbs. Pressures above 25 lbs. and not exceeding 90 lbs. require a minimum operating differential of 10 lbs.
Where the pressures are from 90 lbs. to 150 lbs an operating differential of from 15 lbs. to 20 lbs. is the minimum.
Pressures of from 150 lbs. to 300 lbs. require a 25 lb. to 30 lb. minimum operating differential. Higher pressures available.

LIST PRICES:

	Standard Range 1 lb. to 4 lbs. Adjustable 7 to 10 lbs.	Maximum Operating Pressure 0 lbs. to 15 lbs.	Maximum Operating Pressure 15 lbs. to 60 lbs.	Maximum Operating Pressure 60 lbs. to 300 lbs.
Figure 31 Single Pole	$20.00	$22.00	$24.00	$30.00
Figure 31-A Single Pole	17.00	19.00	21.00	27.00
Figure 31-L (3-wire)	20.00	22.00	24.00	30.00
Figure 31 Two Pole or two circuit	26.00	28.00	30.00	36.00

The above maximum operating pressures do not refer to differentials or the difference between the cutting in and cutting out points. In ordering pressure controls specify the cutting in and cutting out points required.

Double Adjustment Type shown on page 20.

Case diameter, 5¾". Height overall, 7⅜". Depth 3¼" with outlet box.

Shipping Weight 4 lbs. 14 oz.

MERCOID System of DIRECT CONTROL

Mercoid Immersion Type Controls

For Hot Water Boilers

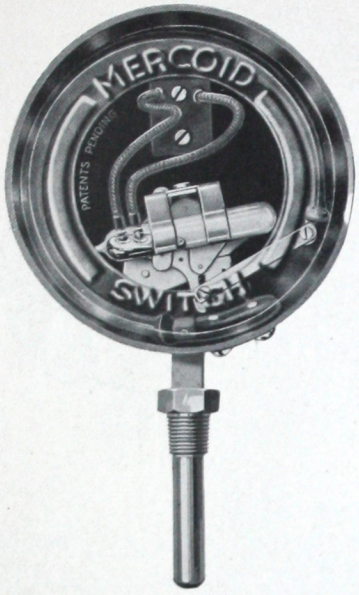

Figure 36

The Mercoid Immersion Type Hot Water Boiler Controls, have proven by their unfailing accuracy and durability over years of service to be the correct type of automatic limiting device for control of motor-driven units on hot-water boiler installations.

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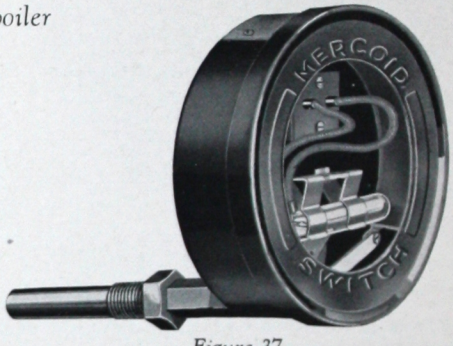

Figure 37

FIGURE 36

Straight stem immersion type boiler control.

Furnished with simple adjustment for raising or lowering the cut-in and cut-out points.

½″ connection, with 3″ stem.

¾″ connection, with 1¾″ stem.

Diameter of all immersion type cases 5¾ in.

Finished in black enamel rubber finish.

FIGURE 37

Back angle type ½″ connection with 3″ stem.

Furnished for hot water storage tanks and for installation in the sides of boilers, below the water line, where the straight stem cannot be used.

Particularly adapted for positive control on vapor-vacuum systems, with special range 200° to 214° F., adjustable up to 214° to 226° F., for installation below the water line.

The above controls are equipped with the Mercoid snap action movement and are intended for direct control where the normal working loads do not exceed 10 amperes at 110 volts or 5 amperes at 220 volts, A. C. or D. C.

FIGURES 36-L AND 37-L

Identical in style and design with Figures 36 and 37, respectively, except for the two-circuit arrangement, for 3-wire or low voltage requirements. Made with one each, red, white and blue binding posts. Will handle currents not in excess of one ampere at 110 volts A. C. or D. C.

List of standard ranges available for these controls given on next page.

Double adjustment types of hot water boiler controls shown on page 21.

See opposite page for list prices.

Mercoid Immersion Type Controls

For Hot Water Boilers (Cont'd)

Figure 36-A

All Mercoid Immersion Type Controls shown on this and preceding page are furnished fully automatic, or, where so specified, semi-automatic with hand reset.

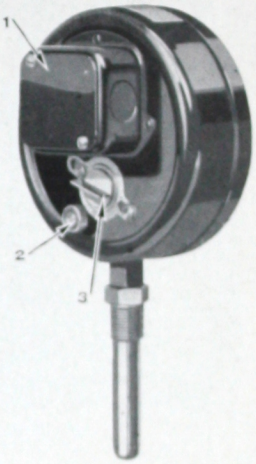

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FIGURE 36-A

EQUIPPED with Fig. 17 Mercoid tube. For applications where the current requirements do not exceed 3 amperes at 110 volts, A. C. or D. C.

½″ connection, with 3″ stem.

¾″ connection, with 1¾″ stem.

Figure 37-A furnished for above current requirements, where back angle type is required, supplied with ½″ connections with 3″ stem, unless otherwise specified.

All types can be furnished for semi-automatic operation to cut in on either a rise or drop in temperature, as specified, with manual reset for resuming operation.

All types of Mercoid hot water boiler controls have a simple adjustment for raising or lowering the cut-in and cut-out points.

1. Improved type outlet box, with outside screws for making quick electrical connections.
2. Knurled hand reset button furnished on both fully automatic and semi-automatic types of instruments.
3. Hand adjustment for raising or lowering boiler control setting.

STANDARD RANGES:

140-160° adjustable up to 165-180° F.
140-180° adjustable up to 175-200° F.
(most commonly used)
160-180° adjustable up to 190-200° F.

STANDARD RANGES:

For Vapor-Vacuum Control:
With back angle stem (Figure 37)
200-214° adjustable up to 214-226° F.

LIST PRICES:

Fig. 36	Fig. 37	Fig. 36-L	Fig. 37-L	Fig. 36-A	Fig. 37-A
$22.00	$23.00	$22.00	$23.00	$19.00	$20.00

For 2-Pole or two circuit Types add to above lists:
Figure 36—$6.00 Figure 37—$6.00

Double adjustment types of hot water boiler controls shown on page 21.

Diameter of instrument, 5¾″. Height over-all 10″. Length on back angle type 9″ over-all. Depth 3¼″ including outlet box
Shipping Weight 4 lbs

The Mercoid Risertherm

Surface Type Control with Mercoid Thermal Element

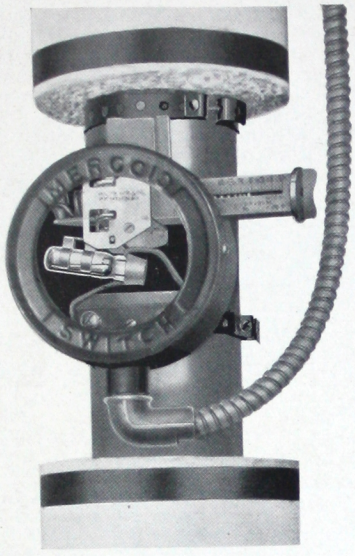

Figure 35 Risertherm mounted on vertical pipe.

Simple to install.

External temperature adjustment. One type fits either horizontal or vertical pipe.

Clamp feature locks instrument securely in place.

Fits any pipe or hot water tank. Positive Snap Action.

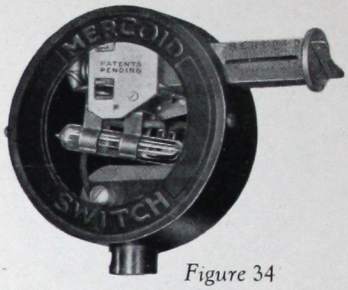

Figure 34

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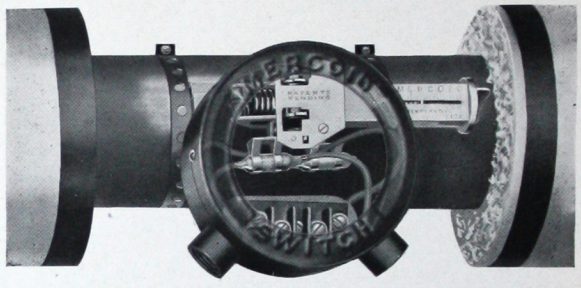


Figure 35L Risertherm mounted on horizontal pipe.

THE Risertherm is a temperature limiting device designed to be clamped on the risers of hot water heating systems or the surfaces of hot water tanks or pipes to regulate the temperature within.

Simplicity of installation and ease of adjustment are outstanding features of the Risertherm.

The same instrument may be quickly installed in either a vertical or horizontal position. This feature is a convenience to the installer and economizes on stock.

The Risertherm is sturdy in construction and is built for enduring service. Every precaution has been taken to insure safe and dependable performance. If the thermal element should be removed or injured in any way, the circuit will automatically open and stop the equipment.

The clamping arrangement, properly installed, securely holds the instrument in a permanent position, removes the danger of slipping on the pipe or tank and prevents accidental disarrangement.

The Risertherm meets fully the possibilities attainable in this form of application.

The Risertherm is not recommended for vapor-vacuum heating systems. For this purpose Fig. 37 is recommended. See page 8.

FIGURE 34
For Dual Control of Unit Heaters

THIS instrument is designed to close the circuit when the temperature rises to a predetermined point, opening the circuit when the temperature falls. Used in connection with a thermostat for dual control of unit heaters to prevent operation of the fan until the coils are heated, insuring economical operation.

FIGURE 35

This instrument is designed to open the circuit when the temperature rises to a predetermined point, closing the circuit when the temperature drops. Used as a limiting device in connection with automatic hot water heating equipment.

The Fig. 34 and 35 instruments are regularly supplied with Fig. 3 tube, handling currents up to 10 Amp. at 110 Volts and 5 Amp. at 220 Volts, A. C. or D. C.

Fig. 34-A and 35-A are identical in design with Fig. 34 and 35 except that they are regularly supplied with Fig. 17 tube, handling currents up to 3 Amp. at 110 V. and 1½ Amp. at 220 Volts, A. C. or D. C.

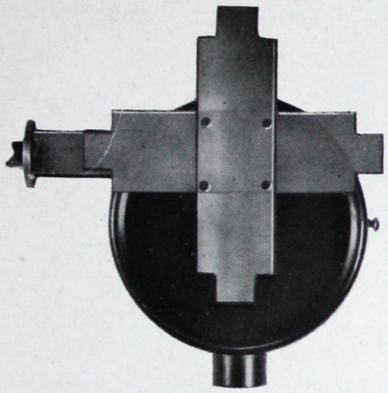
Fig. 34-L and 35-L are also identical except that they are supplied with the two circuit arrangement for 3-wire or low voltage requirements. Made with special terminal block clearly marked for such installations.

STANDARD RANGE

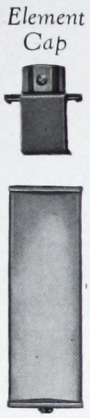
Standard range is between 110° F. and 200° F. A special range between 140° F. to 230° F. is available when specified. The operating differential of both ranges is approximate 6° F. to 24° F. according to the size of pipe and the conditions of the installation.

The Mercoid Risertherm *(Cont'd)*

Surface Type Control with Mercoid Thermal Element

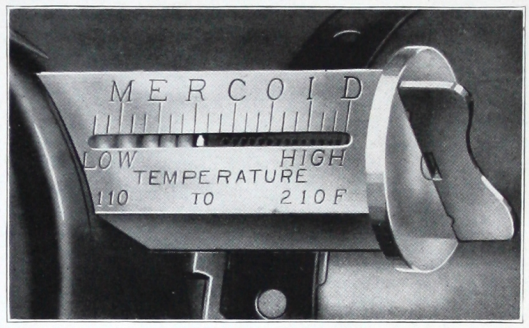


Showing Both Vertical and Horizontal Mounting Positions



Mercoid Thermal Element

Element Housing



External Adjustment

THE specially designed Mercoid thermal element employed in the Risertherm makes it possible to offer a surface type hot water control embodying the snap action movement and the definite "on" and "off" points found in the other types of Mercoid controls.

This element is the result of many months of careful research and test. Its characteristics are similar to the Mercoid Bourdon tubes as to material, reliability and life.

It is made very light in order to secure sensitivity, yet it possesses great strength and can be depended upon to give enduring service.

The Risertherm is so designed that in case the Mercoid thermal element is removed or injured, the circuit opens.

The external adjustment of the Risertherm is located conveniently and a marked scale is employed. Owing to the variations encountered on installations, the scale is marked in letters instead of figures to prevent the user from being misled. The setting in all cases should be checked to the thermometer on the boiler. See combined instrument on page 28.

In designing the Risertherm, attention was given to the demand that it be adaptable to either a vertical or horizontal pipe. This has been accomplished in a simple manner without affecting the sensitivity of the Mercoid thermal element.

The instrument, as furnished, is set for vertical mounting, unless otherwise specified. To change it over for horizontal mounting takes but a few moments. The element cap is removed and the element taken out. Then it is necessary merely to loosen four screws, turn the element housing one-quarter turn and re-assemble. The four screws are locked to the element housing assembly, insuring a rapid re-assembly.

This dual mounting eliminates the necessity of carrying a duplicate stock of controls.

LIST PRICE: (Standard range 110° F. to 200° F.)

FOR UNIT HEATERS

Figure 34	Single Pole 10 amperes	$20.00
Figure 34	Two Pole	26.00
Figure 34-A	Single Pole 3 amperes	17.00
Figure 34-L	Low Voltage 3-wire	20.00

FOR AUTOMATIC HEATING EQUIPMENT

Figure 35	Single Pole 10 amperes	$20.00
Figure 35	Two Pole	26.00
Figure 35-A	Single Pole 3 amperes	17.00
Figure 35-L	Low Voltage 3-wire	20.00

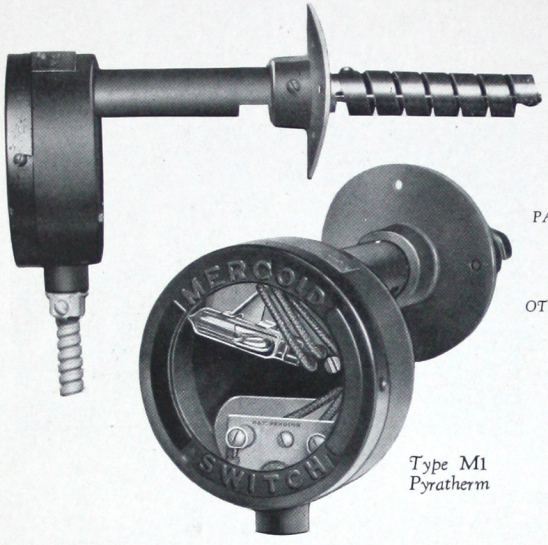
For special ranges add to above list $2.00

Case diameter 4¾″ Over-all measurements 7″ high, 6¾″ wide by 2¾″ deep.

Shipping Weight 5 lbs. 11 oz.

Mercoid Pyratherm

Stack Safety Controls for Domestic and Industrial Oil Burners



Type M1 Pyratherm

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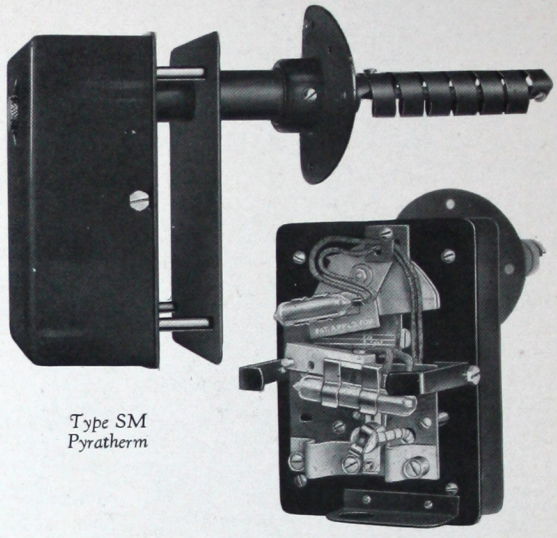
OTHERS PEND.



Type SM Pyratherm

TYPE M1 PYRATHERM

(Without Adjustatherm)

Type M1 Pyratherm is a thermostatic bi-metal stack safety control which acts as a shunt when used with a safety cut-out such as the Adjustatherm.

M1 Pyratherm has a gravity locking mechanism, which is an exclusive Mercoid feature. It provides additional protection by shutting down the burner in case of the burning out or breaking of the thermostatic bi-metal coil. In the past, safety devices of this type under such conditions depended upon having the burner stopped by the thermostat or boiler control. To insure a positive safety operation in such a case, the burner must be shut down at once by the safety device itself, which is precisely what the M1 Pyratherm does. Many other distinctive features included make this instrument the outstanding control of its type on the market.

The superiority of the principles employed in the new Type M1 Pyratherm will be apparent upon a careful study of its mechanism from the drawings in illustration "C" on opposite page. These drawings show the mechanism looking from the rear. No. 1 shows the operating shaft with the bi-metal coil on one end and on the other end is the switch carrier plate to which the Mercoid tube is clamped. This plate revolves on a bearing over the shaft. Note the pivot on the switch carrier plate. This pivot in relation to the shaft and the counter-balance assembly No. 2 should be clearly understood. The counterbalance assembly No. 2 consists of two plates riveted together and slips over the pivot on the carrier plate.

The ratchet wheel No. 3 is inserted between the two plates of the counter-balance assembly through which the shaft must pass. The ratchet wheel has a slot opening in the center which corresponds to the shape of the shaft at its end. This fixes the ratchet wheel in a stationary position in relation to the shaft while all the other parts are free to revolve around the shaft. No. 4 shows the movement assembled. A section of one of the plates is removed to show the position of the ratchet wheel in relation to the free roller pawl.

This pawl revolves between the two plates of the counter-balance assembly and carries its weight from the pivoting point against the ratchet wheel. The weight of the counter-balance assembly bearing between the teeth of the ratchet wheel locks the entire movement in a fixed position. As the shaft is turned by the bi-metal coil, the entire movement travels with the shaft up to the point of resistance or rather the respective stopping points.

If the bi-metal coil forces the shaft to turn beyond the "on" and "off" stopping points, the gravity clutch begins to operate. The force of expansion or contraction of the bi-metal is greater than the force of gravity represented by that portion of the weight of the counterbalance assembly bearing against the ratchet wheel. As this force is exerted against the free roller pawl it lifts the counterbalance assembly and causes the free roller pawl to slip over the teeth of the ratchet wheel, yet the weight of the counter-balance is great enough to hold the entire movement in a fixed position at the "on" or "off" stopping points.

Another safety feature is that the Mercoid Figure 9-27 tube is so designed that the instrument must be mounted in a vertical position to operate. If placed in any other position the circuit is opened, causing the burner to shut down until the instrument is corrected.

Mercoid Pyratherm

Stack Safety Controls (Cont'd)

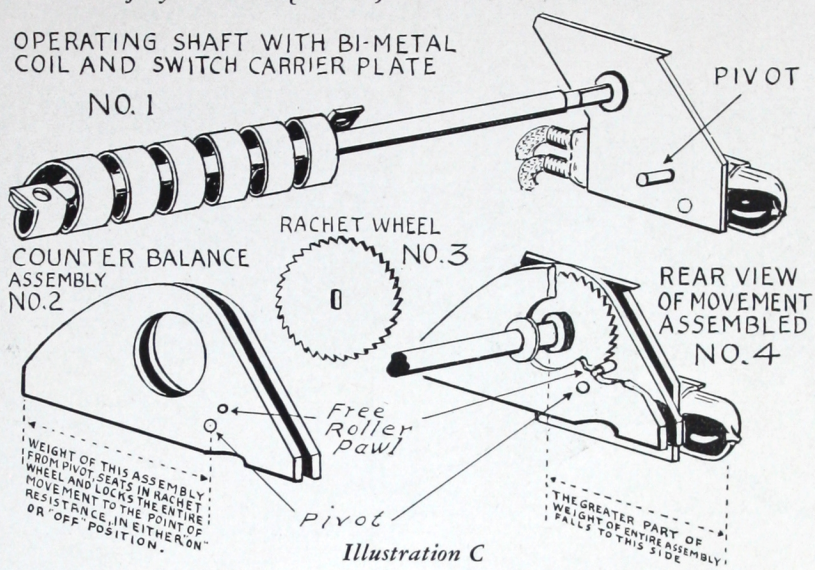


Illustration C

Provisions are made for a simple differential adjustment where required. With this type of adjustment there are no removable pins that might be left out by the installer or loosened by vibration.

The shaft and screws are made of non-corrosive stainless steel suitable for the extreme temperatures encountered.

The most suitable thermostatic bi-metal is used in the coil.

The stamped metal stack flange is strong and light. It will not break, if it should be necessary to shape it to a different contour than the one in which it is supplied. The holes are so arranged that the flange may be placed in either horizontal or vertical position and permit the bolts to be placed above and below.

The conduit or BX is brought in at the bottom, so that no paraffine or other insulating material from the wire can be melted and run down on the operating parts. The Pyratherm M1 is neat and compact in appearance. The finish is lasting.

A glass front is used so that the installer may inspect and test the operation without having to remove the cover. Solid front covers furnished when specified.

The Mercoid Pyratherm M1 is used with any of the following instruments:

Type SDE (Adjustatherm and Electric Ignition Control).
Type SDP (Adjustatherm and Pressure Ignition Control).
Type SDEG (Adjustatherm and Gas Ignition Control).

See page 15.

TYPE SM PYRATHERM

(With Adjustatherm)

Used on burners having either constant ignition, constant gas pilot or where the ignition control is a separate function. Mercoid Pyratherm Type SM is a complete stack safety control, combining two instruments in one; Type M Pyratherm Stack Safety Control and Type S Adjustatherm Safety Cutout. Designed for flue installation, providing protection against flame or ignition failure.

The Pyratherm is the upper or shunt movement while the Adjustatherm or Safety Cutout is the lower movement. In starting position, the switch on Pyratherm is open, and switch on Adjustatherm closed. The flame heats the thermostatic coil which closes circuit in Pyratherm switch and permits burner to operate continuously. Should there be a flame failure, the thermostatic coil would keep the Pyratherm switch open. In that event the current would be forced through a heating element in the Adjustatherm which would open switch on Adjustatherm and shut down the burner. In this manner the combined use of these controls automatically permits the burner to run continuously only while there is a flame in the furnace.

The Pyratherm movement is the same gravity locking mechanism employed in type M1 Pyratherm as described herewith.

The Adjustatherm movement in this instrument is a safety cutout mechanism which is connected in series with the motor. It has a switch which is held in "on" position by a strip of thermostatic metal which is automatically controlled by a heating element. The heating element consists of a pile of carbon discs with a screw for varying the resistance of the heating element. When the carbon discs are allowed to heat for a predetermined time, the thermostatic metal will warp, release latch and allow tube to trip to "off" position, stopping the burner motor. To keep the carbon discs from heating during continuous operation, most of the motor current is "bi-passed" around the heating element, through the Pyratherm. The instrument has the same flange as type M1. The case is oblong and closed throughout. Finished with black heat resisting enamel.

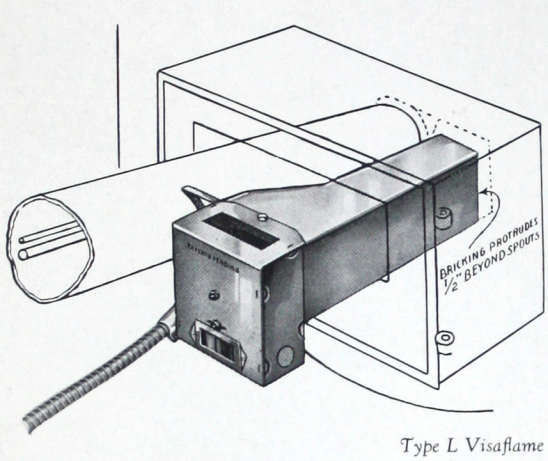
No relay or starting switch is necessary on either type SM or M1 Pyratherm where the normal working loads do not exceed 10 amperes at 110 volts or 5 amperes at 220 volts, A. C. or D. C.

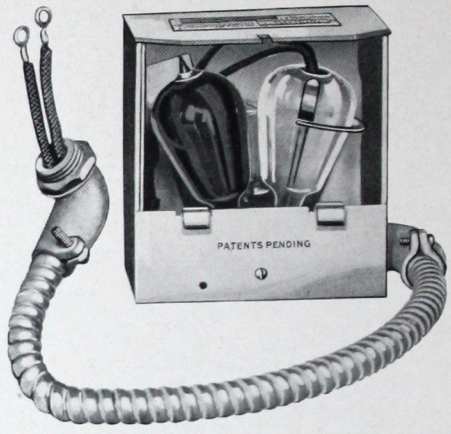
LIST PRICES

Type M1 Pyratherm without Adjustatherm. (See Page 15 for combination list) $15.00
Size 12" long over-all. Depth to flange 7". Diameter of case 4¾". Shipping Weight 4 lbs. 13 oz.
Type SM Pyratherm with Adjustatherm 30.00
Type SM Pyratherm with Adjustatherm including alarm circuit 33.00
Size 12½" long overall. Depth to flange 7½". Case 6¾" x 4" x 2⅝". Shipping Weight 6 lbs. 11 oz.

MERCOID System of DIRECT CONTROL

Mercoid Visaflame Safety Control



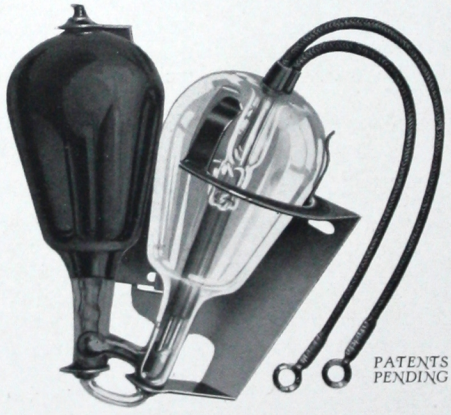


Type L Visaflame illustrating one type of mounting.

A POSITIVE, final safety device, designed to guard unfailingly against hazardous conditions which may result from failure of flame or ignition.

The Visaflame allows the burner to operate only in the presence of actual visible light from the flame, even though incandescent conditions exist in the combustion chamber following flame failure.

This device is the result of years of research and study of oil burner conditions and needs. The Visaflame was perfected with a realization of the vital necessity of providing a safety for oil-burning equipment that would adequately meet any emergency that might arise.



Detail construction of the above shows the Visaflame mounted in specially designed mounting clips.

The Mercoid Adjustatherm, for use in connection with the Mercoid Visaflame Type L Safety Switch, is mounted directly on the burner. Wiring connections are made at the factory of the oil burner manufacturer, eliminating the necessity for wiring at the time of installation.

The Type L Visaflame operates from the light of the flame. To secure accurate operation it is necessary, in every instance, that each type of burner be submitted for a preliminary laboratory test. The Engineering Department of The Mercoid Corporation are ready to conduct all necessary tests to determine the proper location of the Visaflame on any type of burner.

At the present time this device is sold through the manufacturer of the burner on which it is installed at the factory. Where it is desired to install a new safety device on old installations in place of obsolete or unsatisfactory devices, type "SM" Pyratherm shown on page 12 is recommended.

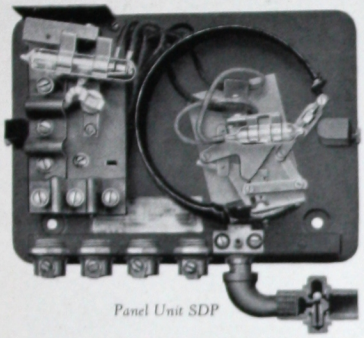
LIST PRICES

Visaflame only	$25.00
Visaflame with type S. D. P. Panel Unit	60.00
Visaflame with type S. D. E. Panel Unit	62.00
Visaflame with type S. D. E. G. Panel Unit	67.00

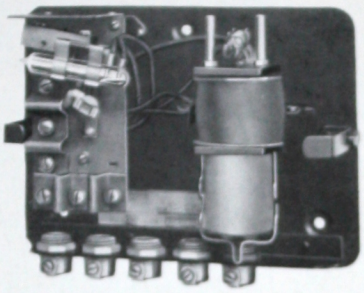
MERCOID System of DIRECT CONTROL

Mercoid Combination Panel Units

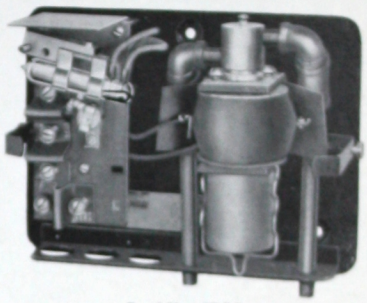
with Adjustatherm and Ignition Cutoff



Panel Unit SDP



Panel Unit SDE



Panel Unit SDEG

(These controls are used in conjunction with either M-1 Pyratherm or Visaflame)

S. D. P. PANEL UNIT

A complete safety and ignition control for pressure type oil burners, consisting of two controls mounted on one panel; the Adjustatherm and Pressure Ignition control.

The Adjustatherm is connected in series with the motor. It has a mounted switch held in "on" position by a strip of thermostatic metal which is automatically controlled by a heating element. The heating element is adjustable so as to permit the regulation of time between the starting of motor and safety shut down of motor in case of ignition failure. It is also adjustable so as to take care of the different loads on large or small motors if they are within the required ratings of the Mercoid tubes. To keep the heating element from heating during continuous operation, most of the motor current is "bi-passed" around the heating element through either of the following safety shunting controls. Visaflame L-1, Pyratherm M-1.

When the oil burner is first started the motor current passes through the heating element in the Adjustatherm, permitting the motor to run until the heating element trips off the switch after a predetermined time. If the oil is ignited it causes the safety shunting control used to close its circuit permitting the burner to operate. If the oil is not ignited the safety shunting control would fail to operate and cause the current to be forced through the heating element up to the point where it would automatically trip off the switch on the Adjustatherm and stop the motor.

The pressure ignition control is operated by the oil pressure of the burner and is used to control the duration of ignition after burner has started. It employs a Bourdon tube which trips the ignition switch in "off" position when a predetermined time is reached and trips switch back in "on" position when a lower pressure is reached.

An ignition delay valve is used on this control which is inserted between the Bourdon tube and the source of pressure. The delay valve acts as a means of delaying any desired ignition cutout long enough to permit combustion. (See page 16 for detailed operation of this valve.) The following range applies to SDP Panel Unit: 60 lbs. (cut-in) to 85 lbs. (cut-out) adjustable, 125 to 150 lbs. Other ranges available.

Standard type cover showing hand reset used on Panel Units SDP, SDE and SDEG.

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OTHERS PENDING

S. D. E. PANEL UNIT

A complete safety and ignition control for all types of automatic oil burners using intermittent ignition. It consists of the Adjustatherm described with Panel Unit SDP and the electric ignition control which consists of a Mercoid switch mounted on an electrically operated dash pot. The switch is normally "on" but when the current passes through the coil it snaps off. This is due to the charged action of the core coming up from the dash pot. There is a delay in the upward movement of the core caused by the retarding action of the oil. The time it takes for the core to be released from the oil is the time during which ignition is obtained.

S. D. E. G. PANEL UNIT

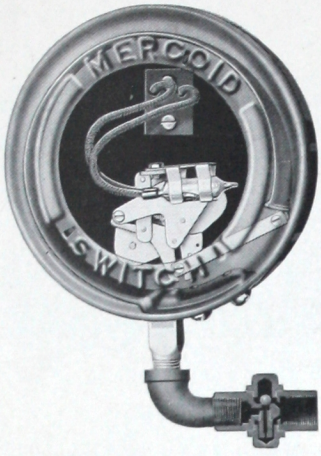
A complete safety gas ignition control for all types of burners employing an expanding gas valve for ignition purposes. It consists of the Adjustatherm (described with SDEP) and an electrically operated expanding gas valve, located on the right side of the panel. It has an electric solenoid which is used both to open and close the valve. This feature eliminates the necessity of installing an additional gas valve control. The solenoid is connected in series with the motor. When the burner motor is started the valve is opened and a magnetic pull upward is exerted on an iron core located in the dash pot. Attached to this core is a threaded stem and a piston which is immersed in oil. The oil retards the action of the core, providing a period of extended flame for ignition. The piston can be adjusted to provide an ignition period of four seconds to one minute. When released from the oil the core rises and closes the gas valve. The pilot is also adjustable.

All of the above Panel Units are intended for direct control where the normal working loads do not exceed 10 amperes at 110 volts or 5 amperes at 220 volts.

LIST PRICES		With M-1 Pyratherm	With Visaflame
Panel Unit S. D. P.	$40.00	$53.00	60.00
Panel Unit S. D. E.	42.00	55.00	62.00
Panel Unit S. D. E. G.	47.00	60.00	67.00

Size of Panel Units: 9" wide, 6½" high, 3" deep.
Shipping Weight Approximately 11 to 12 lbs.

Mercoid Ignition Controls



Type PI

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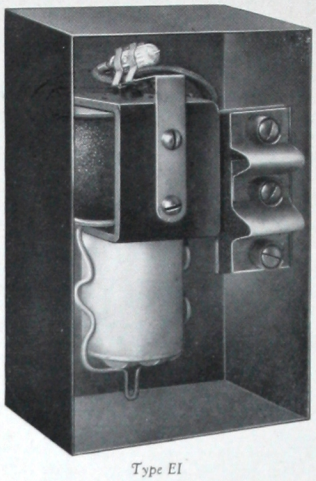
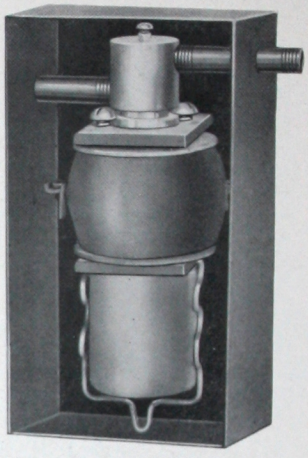
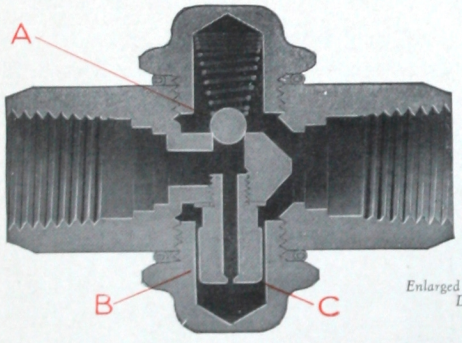


Type EI



Type GI



Enlarged Section of Ignition Delay Valve

Orifice Plug

PRESSURE OPERATED IGNITION CONTROL

The PI Ignition Control is designed to control the duration of ignition period on the pressure type oil burners.

Composed of the Mercoid Pressure Switch and a special designed delay device (see section illustration above) consisting of a ball check valve "A" in multiple with a delaying orifice "B."

To change orifice plug unscrew cap "C" at the bottom, then unscrew the orifice "B" and replace with one of proper size. Orifice plugs are furnished with holes of .004", .006", .008", .010", .012" and .014", and larger to suit timing requirements.

The PI ignition control is usually attached between the pump and the pressure regulator on the burner. When the burner starts the orifice "C" delays the pressure in the switch a predetermined period and when it stops the ball check "A" allows the pressure in the switch to fall with that in the burner resetting the switch before the burner fire has gone out. In the event of failing or fluctuating oil pressure while the burner is operating, the spark will reset before the pressure is low enough to extinguish the flame. In case the pressure adjustment is set too high for the switch to trip off or too low to allow sufficient timing with proper restoration on pressure fluctuation, adjustment should be made in accordance with the instruction sheet for the pressure control.

TYPE EI
ELECTRICALLY OPERATED IGNITION CONTROL

The Type EI ignition cut-off is designed for installation on oil burners of other than pressure types.

The magnetic timer is simple in construction, consisting of a solenoid across the line and an adjustable movable iron core within the solenoid. Attached to the core is a threaded stem and piston sliding in an oil filled dashpot. The timing feature obtained by this dashpot is very accurate and dependable. As the piston leaves the dashpot, a quick break is obtained. The device resets immediately upon interruption of current.

TYPE GI
ELECTRICALLY OPERATED EXPANDING GAS VALVE

This instrument is a combination of an expanding gas valve and an electrical solenoid which controls the duration of the ignition period. Used on any type of oil burner employing gas ignition.

The solenoid is connected in series with the motor. When the burner motor is started the valve is opened and a magnetic pull upward is exerted on an iron core located in the dash pot. Attached to this core is a threaded stem and a piston which is immersed in oil. The oil retards the action of the core, providing a period of expanded flame for ignition. The piston can be adjusted to provide an ignition period of 4 seconds to one minute. When released from the oil the core rises and closes the valve.

VOLTAGE REQUIREMENTS AND IGNITION PERIOD ADJUSTMENT FOR TYPES EI AND GI

Unless otherwise specified the solenoids are supplied suitable for 60 cycle A. C. 110 Volt current. When ordering specify the voltage, whether direct current or alternating, and the cycle, if for alternating current.

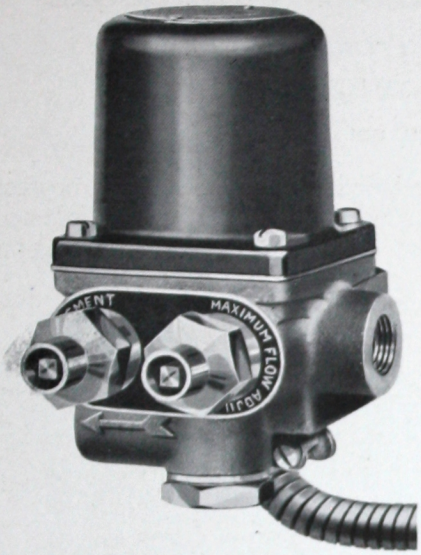
The above controls may also be had in combination with the Adjustatherm as Panel Units shown on preceding page 15.

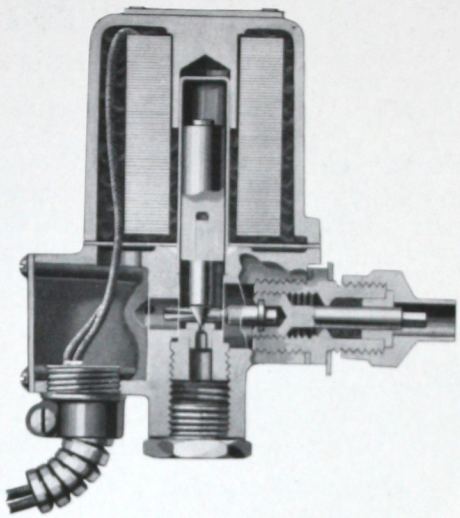
PRICE LIST

Type PI	Pressure Ignition Control	$20.00
Type EI	Ignition Control	25.00
Type GI	Ignition Control	30.00

MERCOID System of DIRECT CONTROL

Type 682 Solenoid Valve





THIS valve is designed for use where it is desired to control the flow of oil, gas, water or air. It has wide application on oil burning equipment, for the oil supply or the gas pilot. It also has broad use in the industrial field. It can be operated by any Mercoid temperature or pressure control—two wire—or controlled manually by a hand switch.

CONSTRUCTION FEATURES

The stainless iron plunger is contained within a brass housing which is soldered to the valve base. There is thus no joint between the plunger chamber and the coil chamber. No gaskets, no leaks. The valve seat is of a special non-magnetic stainless steel which prevents wear, insuring a tight seating of the valve. When current is on, the plunger "floats." It is not in contact with top of housing, eliminating the noise of vibration where used on alternating current. The coil is entirely surrounded by a water and acid proof compound, which prevents "sweating" and possible "shorting" of the coil. Both the coil and the valve seat may be changed without removing the valve from the line. An outlet box is cast in the valve body with removable cover. BX connection at bottom or either side.

OPERATION

When circuit is made the plunger is lifted to open the valve, which remains in that position so long as current is on. Current consumption averages 7 watts. Failure of current causes the valve to close. The valve closes *with* the flow, insuring a tight seat.

MAIN AND BY-PASS ADJUSTMENT

Regularly furnished with adjustment on both main flow and by-pass flow. These adjusting valves are of the well known "metering pin" type which provides extremely fine and accurate control of flow. Lock and shield type with key to prevent tampering with adjustment. This Valve can be furnished with either of these adjustments or both omitted as required.

DATA, DIMENSIONS, ETC.

Valve body brass. Seat stainless steel. Plunger stainless iron. Coil housing cast iron. Pipe connections $\frac{3}{8}$" I. P. S. Port opening $\frac{3}{32}$". Can be furnished with $\frac{1}{4}$" port opening for gas at 3 oz. pressure passing 140 cu. ft. per hr. BX connection $\frac{1}{2}$". Greatest diameter $4\frac{3}{4}$". Height over all $4\frac{3}{4}$". End to end measurement of openings $3\frac{1}{8}$". One key for flow adjustment furnished with each valve. Regularly furnished for 110 volt 60 cycle A. C. Can be furnished for 110 volt 25 cycle, 220 volt 60 cycle, 115 volt D. C, 230 volt D. C. Valve must be installed in vertical position.

ORDERING DATA

In ordering state current on which valve is to be used, kind and pressure of substance passing through valve, whether with or without main and by-pass adjustments. BX connection will be furnished at bottom of outlet box unless otherwise specified. If for special service give full details.

LIST PRICES TYPE 682 SOLENOID VALVE

	110 Volt 60 Cycle	110 Volt 25 Cycle	220 Volt 60 Cycle	115 Volt D. C.	230 Volt D. C.
With both adjustments	$18.00	$19.50	$19.50	$19.50	$20.00
With one adjustment	16.00	17.50	17.50	17.50	18.00
With no adjustments	14.00	15.50	15.50	15.50	16.00

Size: 5" high, 3" wide, and $4\frac{3}{4}$" deep.
Weight Boxed 2 lbs.

MERCOID System of DIRECT CONTROL

Mercoid Combination Controls

For Low Water and Pressure

TYPES AVAILABLE UP TO 300 LBS.

PATENTS ISSUED

1473120; 1598874; 1640869 1644935; 1658013; 1521638

OTHERS PEND.

THE Mercoid Low Water and Pressure Control is designed, primarily, for the protection of automatically-fired steam boilers, but has various other fields of application. Boilers to which fuel is supplied continuously offer the hazard of firing into dry boilers or building up excess pressure, against which this instrument is designed to guard.

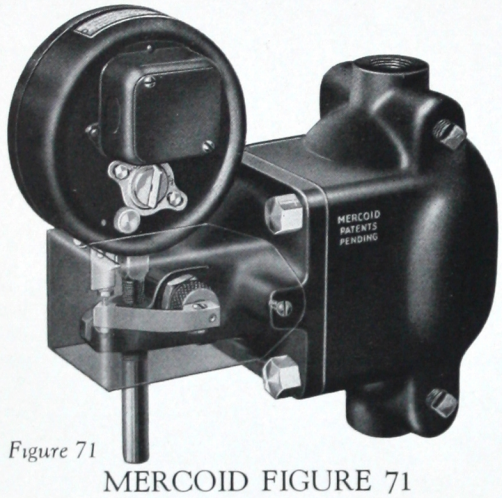


Figure 71

MERCOID FIGURE 71

For Complete Protection

For use on boilers for pressures, as specified, up to 300 lbs. Arranged to break burner motor circuit when water level falls or when steam pressure rises to a predetermined point. Regularly supplied fully automatic, but made semi-automatic with manual reset where so specified.

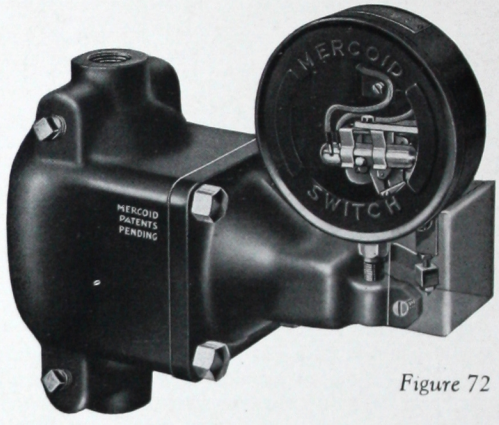


Figure 72

MERCOID FIGURE 72

Low Water Control

Mercoid low water control only, for use on boilers for pressures, as specified, up to 300 lbs. Regularly supplied fully automatic, but made semi-automatic with manual reset where so specified.

Where used for control of motor-driven feed pump, may be arranged to close circuit at low water level.

Available for pressures above 300 lbs., at special prices.

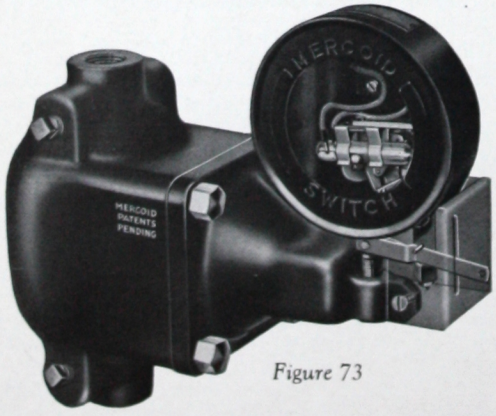


Figure 73

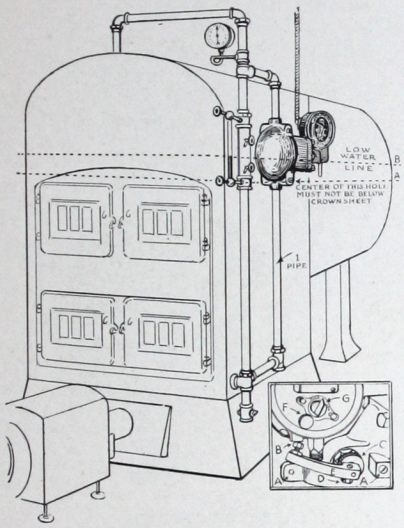
MERCOID FIGURE 73

For Vapor or Vapor-Vacuum

The Figure 73 control has been designed for use where diaphragm regulators are available on the boiler, also for vapor or vapor-vacuum systems having standard equipment floats or diaphragms. This unit may be attached to such installations and positive operation assured, especially where very close pressure regulation is essential.

Mercoid Combination Controls

For Low Water and Pressure Control (Cont'd)



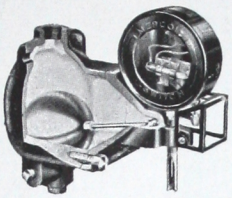
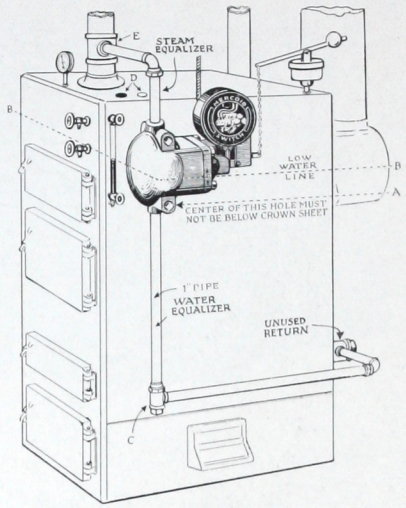


Figure 71
Sectional View



THE illustration to the left is a typical installation of Figure 71 Combination Low Water and Pressure switch. Note method of connecting to boiler, which insures proper operation.

The illustration to the right is a typical installation of Figure 73 Low Water Switch in connection with diaphragm regulator for pressure control. Note—very close control at low cost is possible with this arrangement.

ADJUSTMENTS

(See drawing in square to the left.)

The pressure adjustment and hand reset are similar to those shown on page 7. The shield over low water arm is removed by taking out screw A, the float lever adjustment is shown at B, the packing gland adjusting nut at C, arm E is removed by loosening nut D in case repacking is necessary.

In the manufacture of the shell or float housing of the Figure 71 control, it has been necessary to use a packing gland to secure proper protection at the higher pressures that may be encountered. The stainless iron shaft employed in this gland is ground and lapped to size, preventing the possibility of any imperfections of surface which might tend to produce binding.

Low pressure controls are equipped with seamless copper floats. High pressure controls are equipped with welded steel floats having heavy electro deposited nickel coating.

FIGURE 71

For operating differential within these maximum pressures see page 7.

	Standard 1 lb. to 4 lbs. Adj. 7 lbs. to 10 lbs.	Up to 30 lbs.	From 30 lbs. up to 60 lbs.	From 60 lbs. up to 150 lbs.	From 150 lbs. up to 300 lbs.
Figure 71 Single Pole—10 amperes	$43.00	$45.00	$48.00	$54.00	$65.00
Figure 71-A Single Pole—3 amperes	40.00	42.00	45.00	51.00	62.00
Figure 71 Two Pole		51.00	54.00	60.00	71.00
Figure 71 Single Pole and Alarm		51.00	54.00	60.00	71.00

FIGURES 72 and 73

	Pressures under 150 lbs.	Pressures under 300 lbs and over 150 lbs.
Single Pole—10 amperes	$40.00	$60.00
Single Pole—3 amperes	37.00	57.00
Two Pole—10 amperes	46.00	66.00
Single Pole and Alarm—10 amperes	46.00	66.00

Furnished Automatic or Semi-Automatic as specified.

Size of controls over-all 10¾" high, 14" wide by 5½" deep

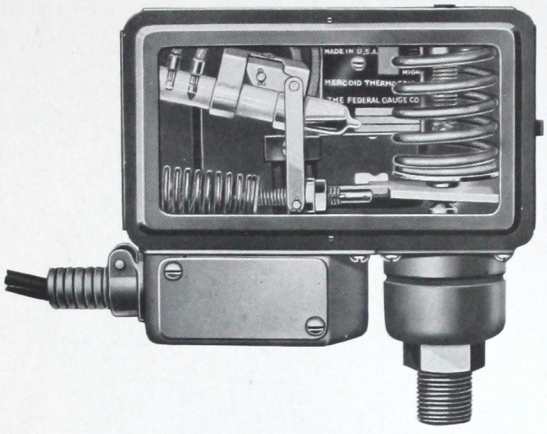
Shipping Weight 40 lbs.

MERCOID System of DIRECT CONTROL

Double Adjustment Mercoid Controls

Type 848

Models A and B



½" Male and ¼" Female Connection

PAT. ISSUED
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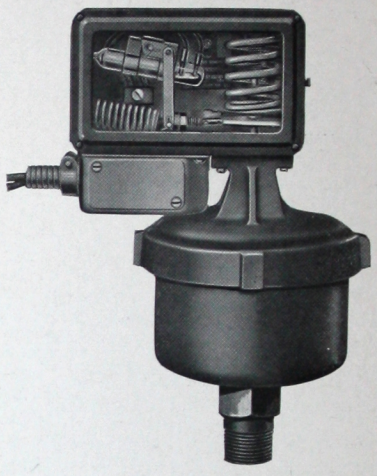
OTHERS PEND.

Models C and D



1" Male Connection

FOR PRESSURE AND VACUUM

(Models A to D Inclusive)

THE types of controls shown on these two pages are furnished and recommended for conditions where it is desired to maintain a close operating differential over a wide range—with double adjustment feature for regulating the cut-in and cut-out points.

The circuit is controlled *direct* to the motor or other electric equipment. No relays, transformers, or other intermediate controls are required for normal working loads of 10 amperes at 110 volts or 5 amperes at 220 volts, A. C. or D. C. As a pilot switch, where used in series with the proper starting switch, the Mercoid will automatically control motors of the largest size.

Models A and B are designed for pressure control on steam, air, gas and water, and are being widely used for boiler controls in connection with oil burners and forced draft coal burning equipment.

Models C and D are designed for vapor, low pressure or vacuum where very close control is required. Model C is widely used for boiler control on vapor systems and Model D gives a similar close regulation on vacuum.

ADJUSTABLE RANGES AND DIFFERENTIALS

Model	C	D
Adjustable Operating Range	1 oz. to 5 lbs.	30 in. vac. to 0 in. vac.
Minimum and Maximum Differential obtained at any operating pressure	1 oz. to 8 oz.	¼ in. vac. to 2 in. vac.

Differentials shown indicate total pressure difference between operation at high and operation at low.

ADJUSTABLE RANGES AND DIFFERENTIALS
MODELS A AND B

Model	A1	A2	A3	B1	B2	B3	B4
Adjustable Operating Range	1 lb. to 15 lbs.	30" vac. to 3" vac.	10" vac. to 10 lbs.	10 lbs. to 60 lbs.	10" vac. to 45 lbs.	30" vac. to 35 lbs.	50 lbs. to 100 lbs.
Minimum and Maximum Differential obtained at any operating pressure	1 lb. to 6 lbs.	2" vac. to 18" vac.	2" to 18" mercury either vac. or pressure	1½ lb. to 10 lbs.	4" to 30" mercury either vac. or pressure	4" to 26" mercury either vac. or pressure	2 lbs. 15 lbs.

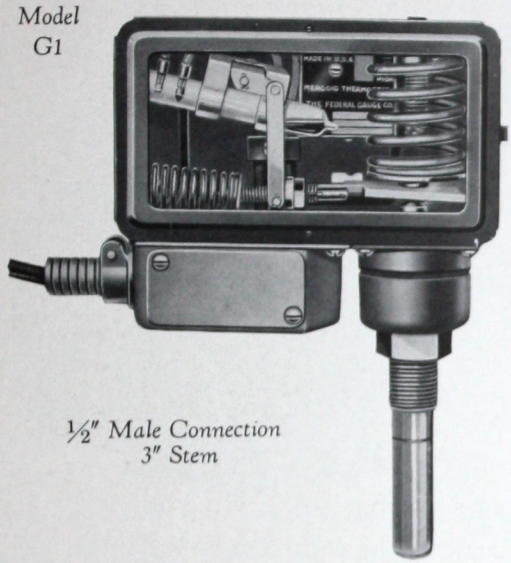
Differentials shown indicate total pressure difference between operation at high and operation at low.

When ordering controls for operation above 15 lbs. please specify if to be used on steam as a syphon will then be necessary.

Double Adjustment Mercoid Controls

Type 848 (Cont'd)

Model G1



½" Male Connection
3" Stem

Model G2

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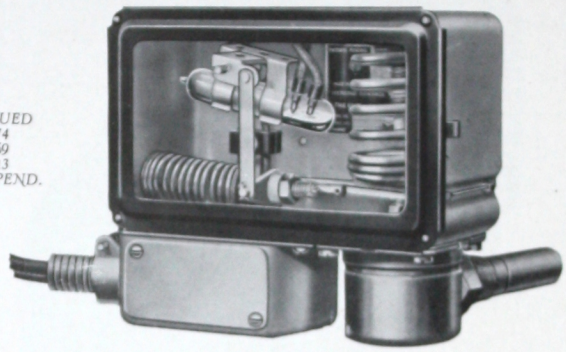
OTHERS PEND.



½" Male Connection
3" Stem

FOR TEMPERATURE

(Models G1 and G2)

DOUBLE adjustment type. For temperature control of hot water boilers and storage tanks. Models G-1 and G-2 are widely used for hot water boiler control in connection with oil burners and forced draft coal burning equipment.

These types have many applications in industrial work where direct connected instruments can be used. The wide ranges available combined with the close or wide operating differentials obtainable will meet practically every requirement.

ADJUSTABLE RANGES AND DIFFERENTIALS
MODELS G1 AND G2

Model	Adjustable Operating Range	Approximate Differentials					
		Minimum when operating point set at			Maximum when operating point set at		
		Low	Med.	High	Low	Med.	High
G1, G2	70° to 180° *110° to 220°	10° 10°	5° 5½°	2½° 3°	46° 48°	40° 42°	24° 25°

*Standard Range

LIST PRICES

Model	Single Circuit	Two Circuit or Double Pole	Shipping Weight
A1	$29.00	$35.00	4 lbs.
A2-A3	32.00	38.00	4 lbs.
B1-B2-B3	32.00	38.00	4 lbs.
B4	38.00	44.00	4 lbs.
C	38.00	44.00	12 lbs.
D	90.00	96.00	12 lbs.
G1	32.00	38.00	5 lbs.
G2	34.00	40.00	5 lbs.

For special ranges add $4.00 to above lists.

Case dimensions of all models measure 6" wide, 3½" high by 2½" deep.

Shipping weights. Models A and B, 6 lbs. 7 oz., C and D, 14 lbs. 7 oz. G1, 6 lbs. 7 oz. and Model G2, 5 lbs. 10 oz.

MERCOID System of DIRECT CONTROL

Mercoid Combination Control

For Pressure and Low Water

Type 612

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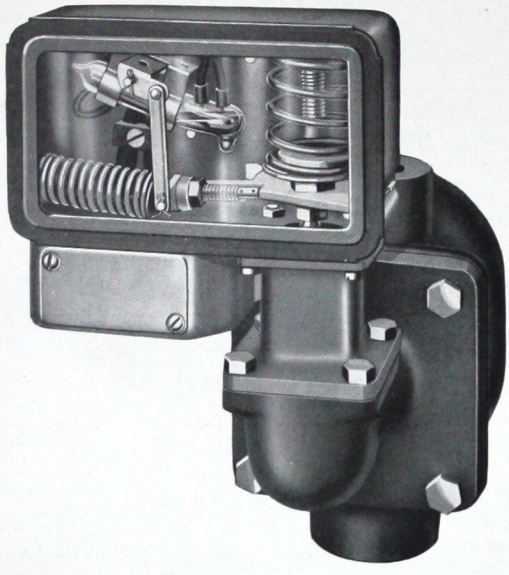
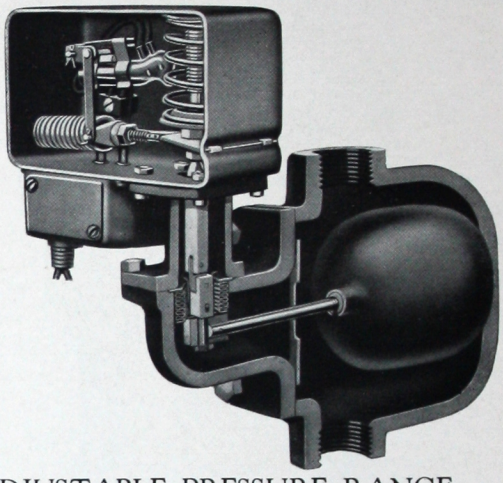
1658013
1674601
OTHERS PEND.





NO. 612 DOUBLE ADJUSTMENT TYPE

THIS control combines the features of double adjustment, as employed in the 848 type controls (shown on page 20), with those of the combined pressure and low water control (see Figure 71, page 18).

This type is suitable only for low pressures, where close regulation is desired, and is recommended for such service in cases where the Figures 71 and 73 are not suitable.

This instrument is so designed that in case of damage to the float, bellows element or Mercoid switch, the circuit will be opened.

The low water cut out is obtained by means of a float in a cast iron water tight housing installed a few inches below the normal water line. As the float falls the Mercoid Switch is tilted and the circuit broken. Pressure control is secured by an all metal bellows which, expanding and contracting with pressure changes, tilts the Mercoid switch to make or break the circuit. The bellows also acts as a seal around the stem.

ADJUSTABLE PRESSURE RANGE

Adjustment for the desired make and break pressures is quickly and easily secured. The complete range is obtainable in the same control without changing or replacing any parts. The No. 612 Mercoid Control can be set to maintain any desired pressure between approximately 6 ounces and 8 lbs. By means of a second adjustment the "differential" can be set for either close or wide control. This differential can be set for control as close as 8 ounces at low pressure. The average minimum differential is ¾ lbs.—the maximum 5 lbs. The adjustable limits are:

	Circuit Broken	Circuit Closed	Differential
Lowest Adjustment—smallest differential	9 oz.	1 oz.	8 oz.
Lowest Adjustment—largest differential	5 lbs.	0 lbs.	5 lbs.
Highest Adjustment—smallest differential	6½ lbs.	5 lbs.	1½ lbs.
Highest Adjustment—largest differential	10 lbs.	5 lbs.	5 lbs.

LIST PRICE:

Control box of steel, cadmium plated with steel hinged cover. Outlet box regularly supplied. Pipe connections 1" I.P.S. Shipping weight 28 lbs. Stock No. 612. List price $44.00 for single pole type.

MERCOID System of DIRECT CONTROL

Mercoid Lever Arm Control

(With either top or bottom mounting)

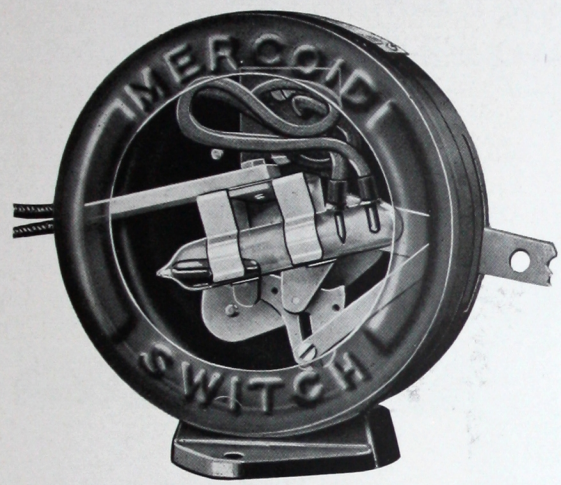


Figure 46

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OTHERS PEND.

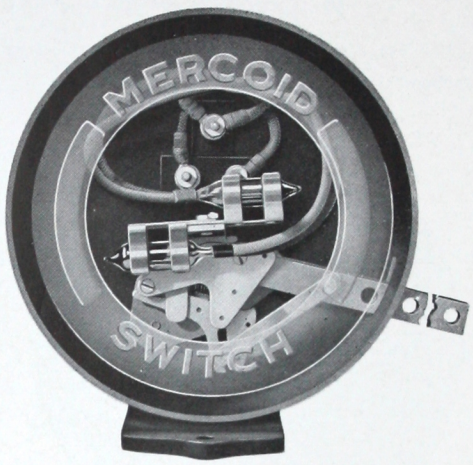

Figure 46-L

MERCOID FIGURE 46

Will handle currents up to 10 amperes at 110 volts or 5 amperes at 220 volts, A. C. or D. C.

MERCOID FIGURE 46A

Equipped with figure 17 three ampere tube.

MERCOID FIGURE 46-L

Designed for 3-wire or low voltage requirements. Will handle currents not in excess of 1 ampere at 110 volts, A. C. or D. C. Furnished with one each, red, white and blue binding posts.

AS A PILOT switch, where used in series with the proper starting switch, the Mercoid will automatically control motors of the largest size.
The above instruments are equipped with the Mercoid snap action movement, to actuate the Mercoid tube, insuring positive "on" and "off" points.
Suitable for close regulation of vapor heating systems that are equipped with diaphragm regulators. (Full information furnished on request.)
Also suitable for automatic control of pumping equipment.
Various types available complete with rod and floats, for fluid level control.
Furnished with semi-glass front and steel ring. Black enamel finish.

In ordering, specify:

1. Desired with top or bottom flange, or with ¼ in. threaded connection.
2. To have right hand or left hand lever arm.
3. To close circuit with lever in up position or in down position.

LIST PRICES:

	Figure 46	Figure 46-A	Figure 46-L
Single Pole	$15.00	$12.00	$15.00
Two Pole or two circuit	21.00		

Shipping Weight 5 lbs.

MERCOID System of DIRECT CONTROL

Mercoid Furnace Controls

A New Design in Furnace Controls Employing a Thermostatic Metal Coil

For Warm Air Furnaces and Booster Fans

Figure M-51

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OTHERS PEND.

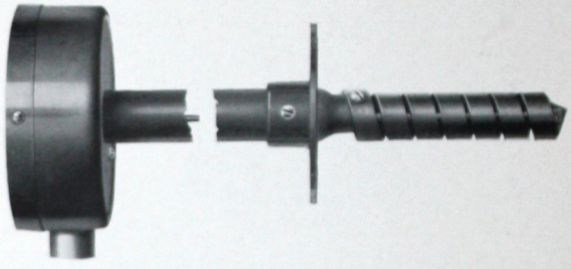

Figure M-51
Showing side view of instrument

This control is used to prevent the overheating of warm air furnaces. Used also for booster fan control. If used as a booster fan control the fan operates after the furnace temperature has reached a predetermined degree and shuts off after the furnace has cooled to a predetermined temperature. This instrument has some exclusive Mercoid features not found in any similar device. It indicates the temperature in the furnace duct so that one may see at a glance what heat the furnace is generating. This information is useful in determining the amount of heat required for any desired conditions.

The case has a glass front which permits the temperature dial to be plainly visible.

Mercoid furnace control M-51 is provided with an adjustable differential.

This control is neat in appearance and easy to install. It is accurate and positive in its operation, and will give long and reliable service.

When ordering specify if it is to be used as a safety furnace control or for booster fan application. The same control can be used for either purpose by simply reversing the Mercoid tube. For furnace control, the mercury switch is placed so that the contacts or electrodes in the switch are to the left side, while for booster fan installation the Mercoid switch is placed with the electrodes to the right side.

The switch tube is shellaced to the clamp at the factory, and if an outside change is made it should again be shellaced so that it will remain in a fixed position.

Type M-51 furnace control can be furnished for two pole or single pole circuits.

No relay or starting switch is necessary where the normal working loads do not exceed 10 amperes at 110 volts or 5 amperes at 220 volts A. C. or D. C.

STANDARD RANGE

50° to 600° F.

The instrument measures 16½ inches long over-all. Diameter of case 4¾ inches. Shipping weight.

LIST PRICES

Figure M-51 furnace control single pole	$18.00
Figure M-51 furnace control two pole or two circuit add to list	6.00

Mercoid Furnace Controls

For Warm Air Furnaces

A POSITIVE SAFETY DEVICE TO PREVENT OVERHEATING

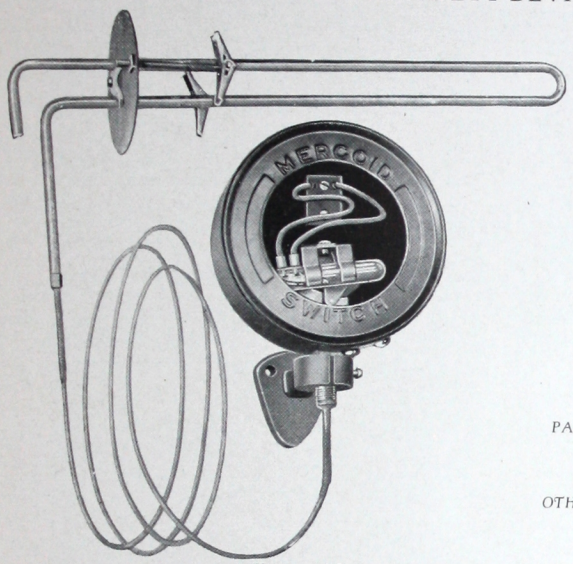

Figure 50

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OTHERS PEND.

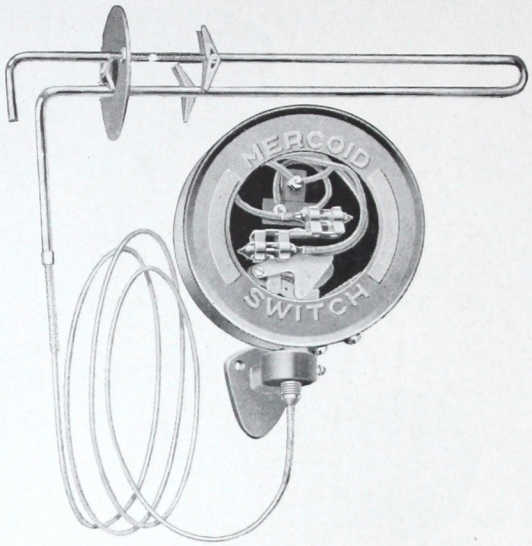


Figure 50-L 3-Wire

FIGURE 50

Will handle currents up to 10 amperes at 110 volts or 5 amperes at 220 volts, A. C. or D. C.

FIGURE 50-A

Equipped with Fig. 17 Mercoid Tube. For applications where the current requirements do not exceed 3 amperes at 110 volts, A.C. or D.C.

FIGURE 50-L (*3 Wire*)

Designed for 3-Wire or low voltage installations Furnished with one each, red, white and blue binding posts. Will handle currents not in excess of 1 ampere at 110 volts, A. C. or D. C.

THE instruments shown above are designed for operation on warm air furnaces that are equipped with motor-driven units. The bronze remote stem, which is charged with an expansive liquid, is intended for installation in the furnace hood above the dome, while the instrument proper may be mounted conveniently on a wall, by means of the bracket provided therefor, as shown in the illustration. When so installed this control operates as a positive safety device to prevent over-heating. Standard range 250° F. to 300° F., opening the electric circuit at the high point and restoring it on a 50° drop in the temperature in the furnace dome. The range may be adjusted by simply sliding the stem in or out of the furnace hood, also by the standard adjustment on the back of the case. Regularly furnished fully automatic; may be furnished semi-automatic, with hand reset, where specified.

Orders should specify whether circuit is to close on rise or fall in temperature.

Furnace Fan Control for automatic control of booster fans on warm air furnaces.

Standard range, 190° F. to 140° F., cutting in at high point to start the fan motor and cutting out when the dome temperature drops to the low point.

LIST PRICES:

Fig. 50, $27.00 Fig. 50A, $24.00 Fig. 50L, $27.00

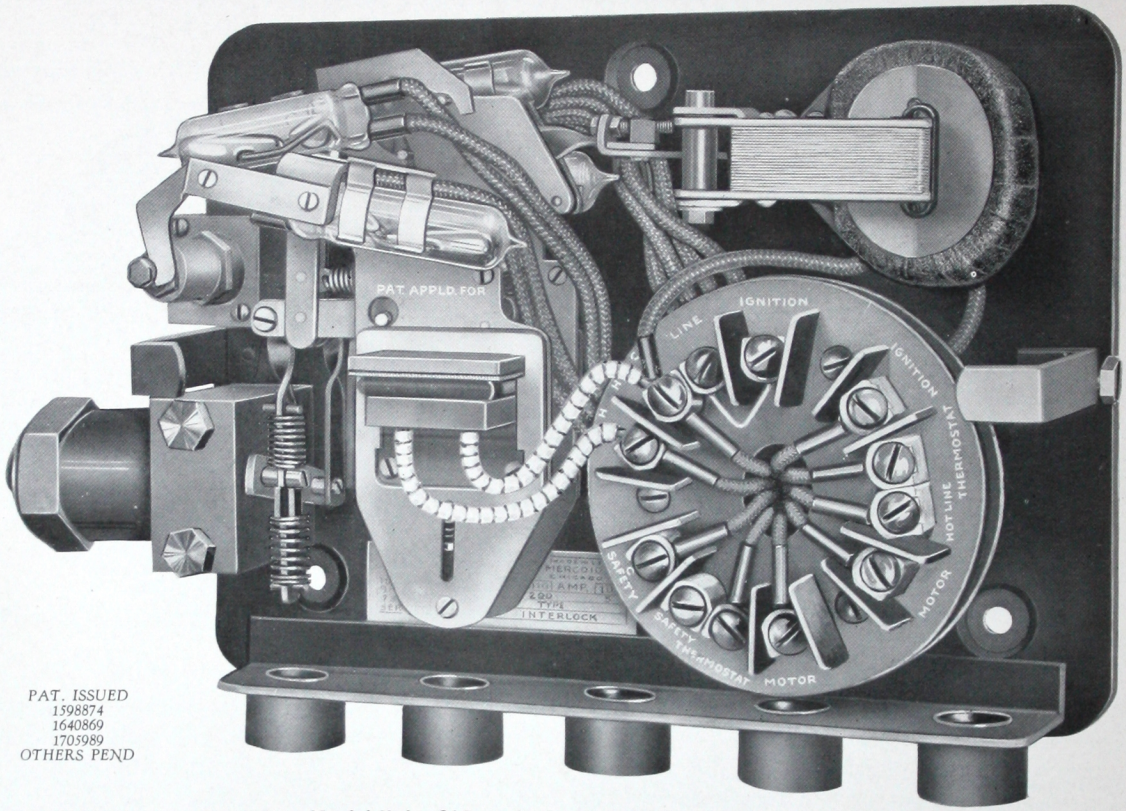
For 2 Pole or two circuit add to list 6.00

Shipping Weight 6 lbs. 11 oz.

MERCOID System of DIRECT CONTROL

The Mercoid Interlock

A Complete Automatic Control for Various Types of Domestic and Industrial Oil Burners



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OTHERS PEND

Illustration No. 1—Interior View of Interlock Used on Oil Burners Employing a Combination of Gas and Spark Ignition and Utilizing An Oil Valve.

The Mercoid INTERLOCK represents the latest improvement in automatic controls.

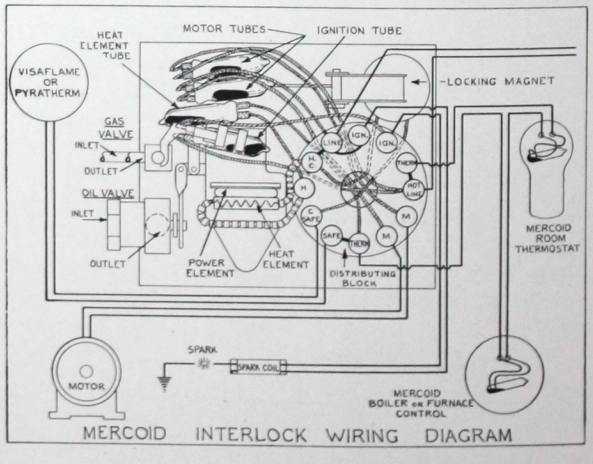
The INTERLOCK is designed to be operated with either Mercoid Visaflame or types M-1 Pyratherm. Proper performance is secured in a simple manner and a great variety of combinations are available in this one unit.

The boiler control and thermostat may be placed either in the main circuit or if desired the equipment may be operated through control circuit only, permitting low voltage instruments if so desired. The INTERLOCK embodies the following principles:

It shuts down the burner upon ignition failure.

In case of interruption of current, fire, or any other reason it automatically restarts after a timed pre-ignition period.

It prevents restarting of the burner until the safety has returned to the "off" position. Prevents restarting unless ignition is "on." Also prevents excessive temperature in heating element by automatic cut-in and cut-out, if safety is in "on" position, preventing starting.



MERCOID INTERLOCK WIRING DIAGRAM

Failure of any portion of the mechanism stops the equipment.

The INTERLOCK is supplied in the following types and styles:

1. For continuous gas or electric pilots.
2. For intermittent electric ignition.
3. For intermittent gas ignition or expanding gas pilot.
4. For intermittent gas and electric ignition.
5. With preheating arrangement for heavy gravity type oils.
6. For hot wire electric ignition permitting preheating of the ignition coil before the burner starts and for a period after the burner is placed in operation.
7. When desired the oil valve is built in as part of the mechanism.
8. Additional types are available to permit starting of the motor before oil is turned on.

The principles embodied in the Mercoid INTERLOCK involve the Mercoid snap action movement and the Mercoid thermal element. It has been so designed that failure of any part of the mechanism will stop the burner.

All tubes are weighted in such a manner as to open circuit in event of damage or deterioration of the springs in the movement.

Should the thermal element be injured the burner can not start. Should the heating element used to expand the thermal element be injured or burned out, the burner can not start.

Should the locking magnet be burned out the instrument will shut down. Both the heating element and the safety locking magnet require small amounts of current, consequently if desired they may be operated on low voltage circuits.

When used with Mercoid Type L Visaflame Type M-1 Pyratherm in case either control is damaged or injured in any manner as to become inoperative, the burner is shut down and operation cannot be resumed until the troubles are corrected.

This switch is further designed in connection with proper flame safety to operate in connection with high-low flame burners, with either electric or gas ignition. Although by far the greatest number of INTERLOCKS will be used on 60 cycle, 110 volt A. C. current; but *two changes* are necessary to adopt it to other currents, namely the heating element and the locking magnet.

The INTERLOCK varies somewhat in construction according to the type of the burner to which it is applied. Illustration No. 1 shows a detailed view of the INTERLOCK as it is used on an oil burner employing a combination gas and spark ignition and utilizing an oil valve. The illustration No. 4 shows the same model in the form of a wiring diagram with names of the different component parts.

The Distributor Block has all terminal wires plainly marked, and provides a convenient connection for hooking up single phase, two phase or three phase motors. There are enough binding posts to permit the connection of only one outside wire to a post.

The Heating Element is an electrical resistance located directly underneath the power element.

The Power Element is a flattened tube filled with a special liquid and sealed on both ends. As the heat is applied to this power element it causes the liquid to expand and operates the mechanism.

The Gas Valve is of the plunger type and is connected to an arm from the ignition tube which closes the gas valve when circuit through ignition tube is open and opens when the circuit through ignition tube is closed.

The Oil Valve consists of two hardened and lapped steel discs with holes drilled perpendicular to the surface. One disc is rotated by a shaft fastened to the center, the other is stationary. When the holes in one disc are in line with the holes in the other disc, the valve is open. To close or open valve one disc is rotated by shaft which is connected to the mechanism in such a way that the valve is open when the circuit through the motor tube is closed, and the valve is closed when the circuit through the motor tube is open.

The type of INTERLOCK shown herewith has a double pole single phase hook-up. For controlling two phase or three phase hook-up, two motor tubes are also employed. For single phase single pole, or where the INTERLOCK control is used to control an industrial starter, only one motor tube is used, in which case this tube does not pass the motor current but only the current going through locking magnet on relay.

Heat Element tube is in series with thermostat, boiler control and heat element.

Ignition Tube is in series with ignition transformer.

Hand Reset is mounted on cover and is operated by a momentary pressure.

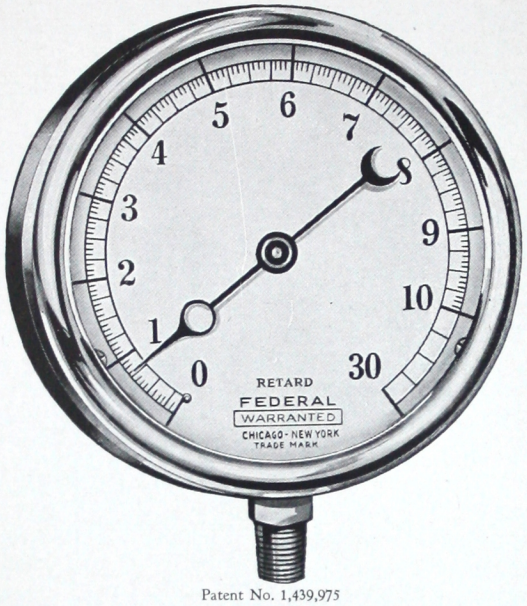
The locking magnet is used to control the mechanism in the INTERLOCK. It is in series with the thermostat, boiler control, and safety control (Visaflame or Pyratherm) and as it operates it locks and unlocks the tubes in different positions according to what takes place in the line up.

The INTERLOCK may be furnished with or without oil valve, gas valve, or ignition cut-off, to meet the conditions of the burner to which it is applied. On types of burners requiring it, preheating circuits are available either for preheating fuels, hot wire ignition, or as otherwise needed. Each particular application will be studied by our engineers, and the proper hook up arranged.

Dimensions of instruments, 9 inches wide by 7 inches high by 3¼ inches deep.

Further information and prices upon request.

Federal Warranted Gauges



Patent No. 1,439,975

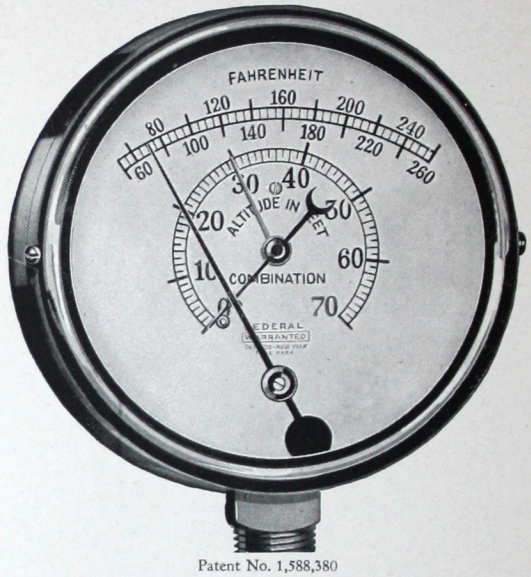
RETARD GAUGE

For Low Pressure Boilers

THIS is a low-pressure gauge, retarded for over-pressure. It is extremely sensitive and registers, in clear ounce graduations, the slightest variation of pressures up to 10 lbs. or less. It is retarded from 10 lbs. to 30 lbs.

Regularly furnished with 4½″ or 5″ dial, steel case, brass ring, case having hard rubber finish. This gauge may be graduated to 5 lbs. in ounces and retarded from 5 lbs. to 30 lbs., where specified.

Especially adapted to oil-burner installations, indicating immediately the first ounce rise in steam pressure.



Patent No. 1,588,380

COMBINED ALTITUDE GAUGE AND THERMOMETER

Both readings are on one dial. All actuating and working parts are made of metal; there are no breakable parts. A bi-metallic element is used, thus eliminating the thermometer glass stem. Standard thermometer tapping for ½″ threaded connection.

Dial size, 3½″ or 4½″. Steel case. Furnished in hard rubber or white enamel finish, as specified. This is an economical, practical and durable instrument, eliminating the additional tapping where it is necessary to install a Hot Water Boiler Control.

Instructions for installing accompany each instrument.

Prices on Application

Safety Float Control

Three Position, Type F

THE Mercoid Three-Position Type F Float-Operated Switch is designed to maintain automatically, a supply of oil in motor driven pump tank units and to give complete protection in the event of an interrupted fuel oil supply or an injury to the float mechanism.

There are three distinct positions. When the float is in the top position, the circuit is opened. On a drop to a predetermined level in the oil tank, the circuit is closed to operate the pump motor. In the event of a break in the oil line, or a punctured float, the float drops to the third or low position, automatically opening the circuit.

This instrument is equipped with a hand re-set, so that the circuit may be closed manually to operate the pump motor until the oil reaches the proper level for the switch to resume the automatic control.

Furnished with 2″ threaded connection or flanged base as specified. Outside diameter of float 2⅛″. Case, 4¾″ in diameter, with semi-glass front and black enamel finish.

This device eliminates the necessity of a return line.

Listed as standard by the Underwriters' Laboratories, Inc.

LIST PRICES:

With Figure 3 Tube (10 amperes—110 volts) $25.00
With Figure 17 Tube (3 amperes—110 volts) 22.00

Shipping Weight 5 lbs.

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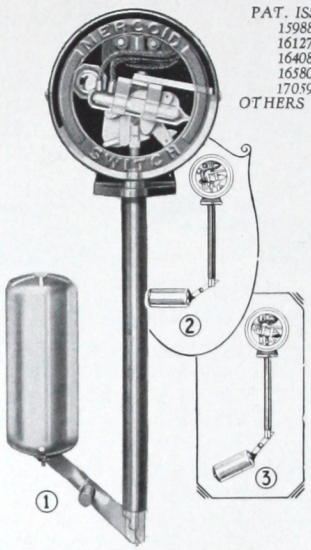
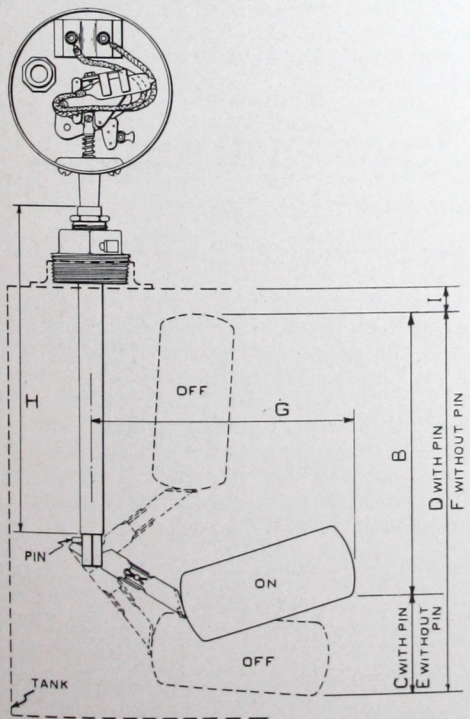
OTHERS PEND.



1—off position—circuit open
2—on position—circuit closed
3—off position—circuit open (when in this position, manual re-set is required)



TANK INSTALLATION DIMENSIONS

A	B	C with Pin	D with Pin	E without Pin	F without Pin	G	H	I
1½″	6⅞″	.....	.....	4″	10⅞″	8″	11″	3″
2½″	7 13/16″	.....	.....	4⅜″	12 3/16″	8⅞″	11″	2¾″
3½″	8¾″	.....	.....	4¾″	13½″	9¾″	11″	2½″
4½″	9 11/16″	3⅜″	13 1/16″	5⅛″	14 13/16″	10⅝″	11″	2″
5½″	10⅝″	3⅝″	14¼″	5⅜″	16″	11½″	11″	1¾″
6½″	11 5/16″	3⅞″	15 5/16″	5¾″	17 5/16″	12⅜″	13″	3¼″
7½″	12½″	4⅛″	16⅝″	6⅛″	18⅝″	13¼″	13″	3″
8½″	13 7/16″	4⅜″	17 5/16″	6½″	19 13/16″	14⅛″	13″	2¾″
9½″	14⅜″	4⅝″	19″	6⅞″	21¼″	15″	13″	2½″
10½″	15 5/16″	4⅞″	20 5/16″	7¼″	22 9/16″	15⅞″	13″	2¼″
11½″	16¼″	5⅛″	21⅜″	7⅝″	23⅞″	16¾	13″	2″
12½″	17 3/16″	5⅜″	22 9/16″	8″	25 3/16″	17⅝″	15″	3½″

MERCOID System of DIRECT CONTROL

Mercoid Switches

PAT. ISSUED 1598874 1640869 1658013 1674601 1705989 OTHERS PEND.

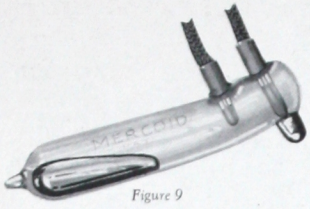


Figure 9

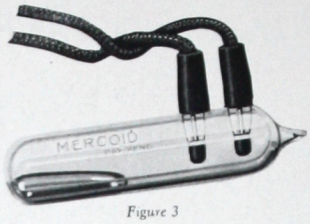


Figure 3

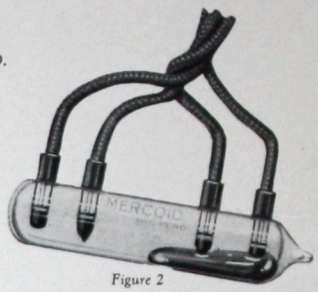


Figure 2

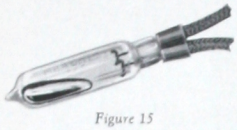


Figure 15

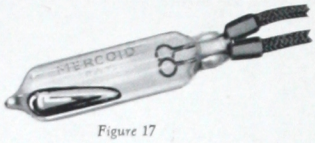


Figure 17

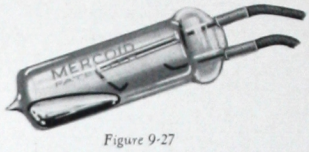


Figure 9-27

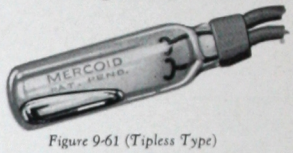


Figure 9-61 (Tipless Type)

THE Mercoid Switches shown on this page are designed for a wide range of service. Figures No. 2, No. 3 and No. 9 have a standard rating of 10 amperes at 110 volts, or 5 amperes at 220 volts, A. C. or D. C., with ample capacity for higher starting loads.

Where fluctuations in voltage are common, causing an abnormal starting load, figure No. 9 type of Mercoid Switch is recommended. For low current or low voltage application, figure No. 15 Mercoid Switch, having a rating of 1 ampere at 110 volts, will meet most operating conditions.

Figures No. 17 and 9-61 Mercoid Switches have a rating of 3 amperes at 110 volts, and are especially designed for low amperage where a small light tube is required.

Figure 9-27 Mercoid Switch is used only as a shunt switch. It has a rating of 10 amperes at 110 volts. Its construction is such that when placed 27 or more degrees in the "on" position it will break contact.

The Mercoid Switch, consisting of a glass tube in which are sealed contacts of special material, contains a quantity of mercury which, when the tube is tilted, will make or break the circuit.

With the Mercoid Switch there is no open arcing, oxidation or corrosion. The contact is permanently clean and instantaneous in operation. The switch contains inert gases hermetically sealed within the tube which stifle the arc instantly.

Where Mercoid switches are desired for use in apparatus that is not of our own manufacture, please advise fully as to the application when requesting prices.

The Mercoid Corporation has a department devoted exclusively to the development and manufacture of special types of Mercoid switches for any desired application.

Prompt and careful study will be made of all problems of this character submitted.

A New Mercoid Tube Development

Marking a Decided Step in Advance in Mercury Switch Construction

New Tipless Tube

Guarded Lead-in Wires

Figure 9-51

The Mercoid switch shown above is the latest and most improved design which the Mercoid Corporation is offering to the trade. Nothing equals it for protection against injury and dependable performance. It is the last word in electrical contact efficiency.

Apart from its sturdy construction, all the material that goes in to make up this Mercoid switch is specially selected and handled with the utmost skill under scientific methods formulated in the laboratory of the Mercoid Corporation. This new design of Mercoid Tipless Tube switch is available in various sizes and types for many purposes.

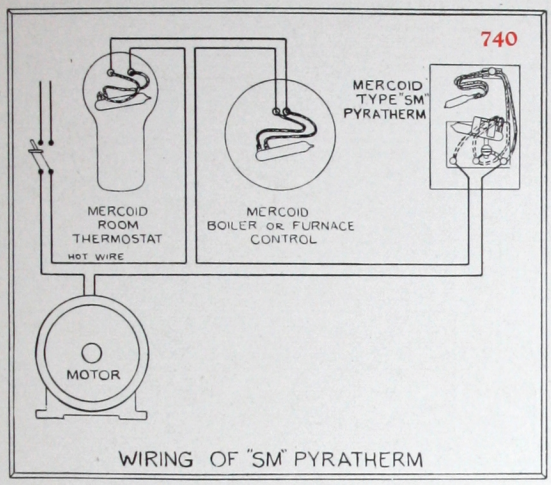
When writing, give the voltage and amperage, also the kind of equipment and use to which the switch is to be subjected, in order that the Mercoid engineering department may fully meet all requirements.

LIST PRICES

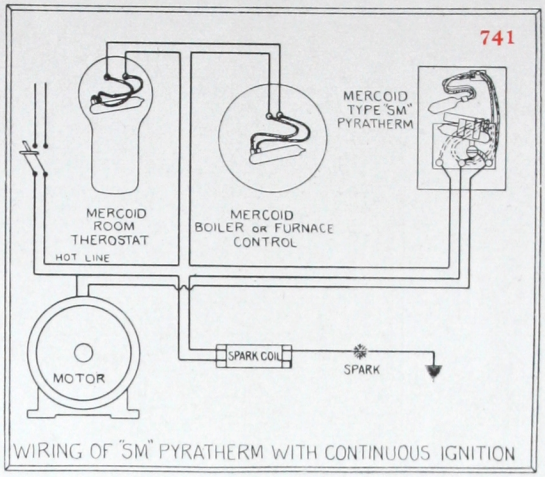
2	Two Circuit	10 amperes—110 volts.	5 amperes—220 volts	$7.00
3	Single Pole	10 amperes—110 volts	5 amperes—220 volts	5.00
9	Single Pole	10 amperes—110 volts.	5 amperes—220 volts. Designed for high starting load	6.00
15	Single Pole	1 ampere —110 volts		2.00
17	Single Pole	3 amperes—110 volts		2.00
9-51	Single Pole	10 amperes—110 volts	5 amperes—220 volts	5.00
9-61	Single Pole	3 amperes		2.00
9-27	Single Pole	10 amperes—110 volts		5.00

TYPICAL MERCOID WIRING DIAGRAMS

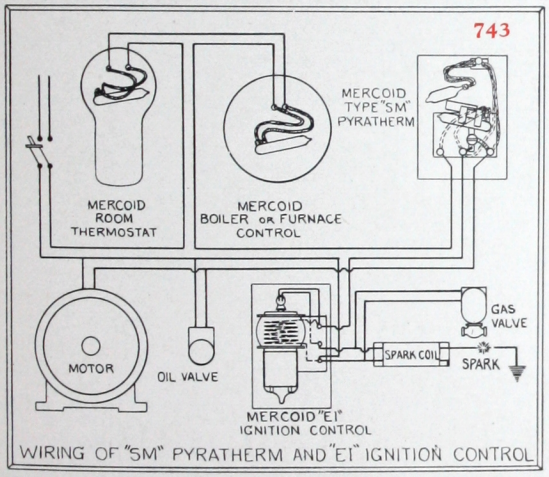
THE simplicity of the Mercoid system of 2-wire direct control is fully recognized. There are no confusing or intricate wiring installations to be made. The hazards and expense of improper hookup are avoided.



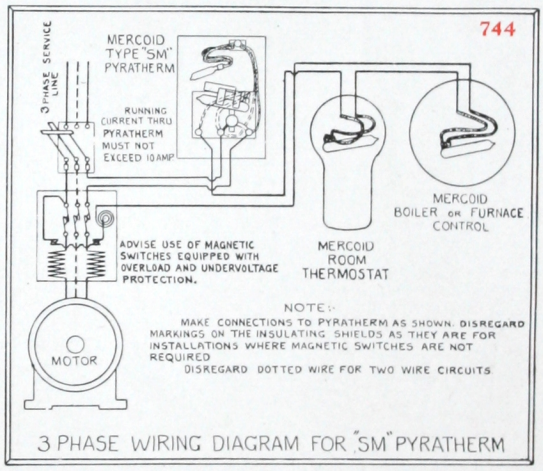
WIRING OF "SM" PYRATHERM



WIRING OF "SM" PYRATHERM WITH CONTINUOUS IGNITION

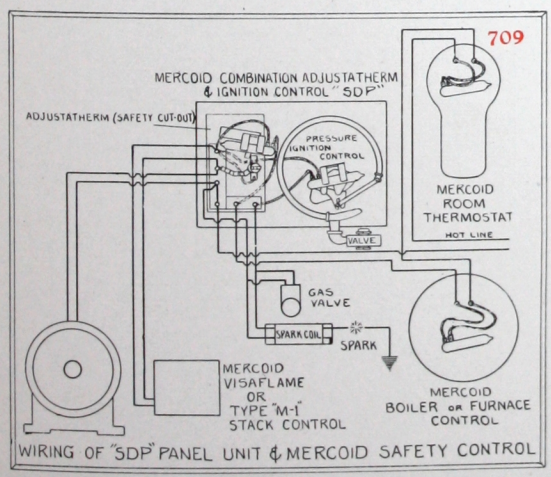


WIRING OF "SM" PYRATHERM AND "EI" IGNITION CONTROL

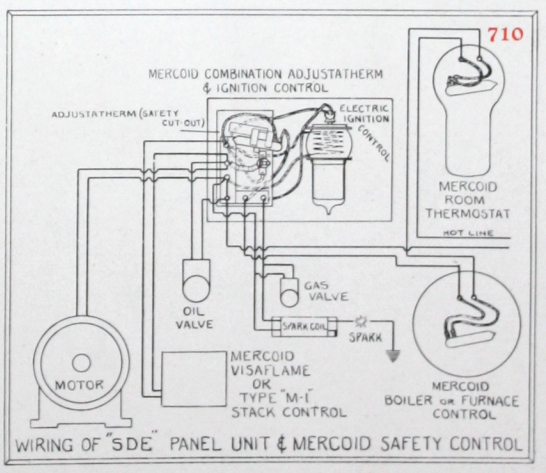


3 PHASE WIRING DIAGRAM FOR "SM" PYRATHERM

The hookups shown above are typical of the usual oil burner installations in connection with the Pyratherm Type SM



WIRING OF "SDP" PANEL UNIT & MERCOID SAFETY CONTROL

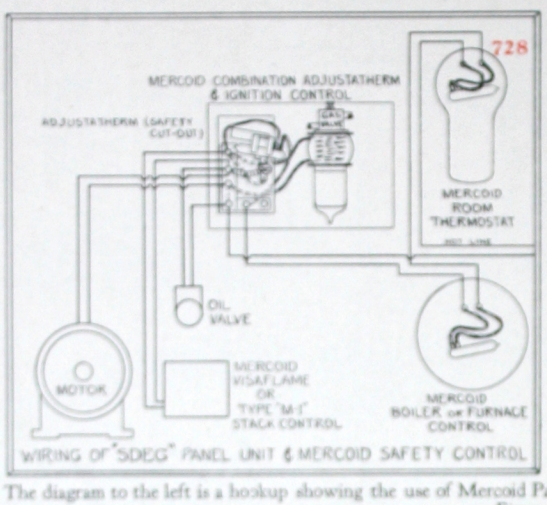


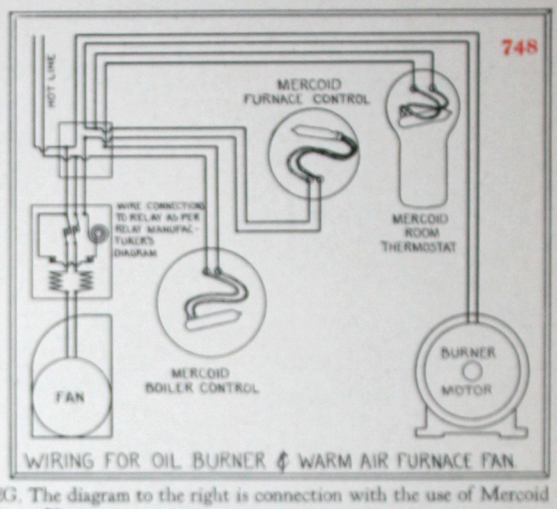
WIRING OF "SDE" PANEL UNIT & MERCOID SAFETY CONTROL

The hookups shown above are typical of the usual oil burner installations in connection with Mercoid Panel units SDP and SDE.

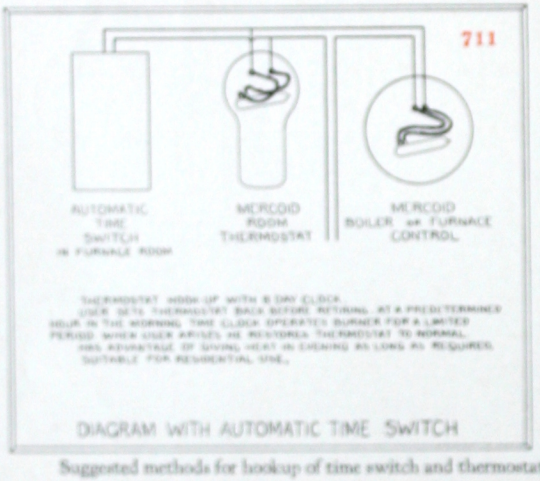
TYPICAL MERCOID WIRING DIAGRAMS

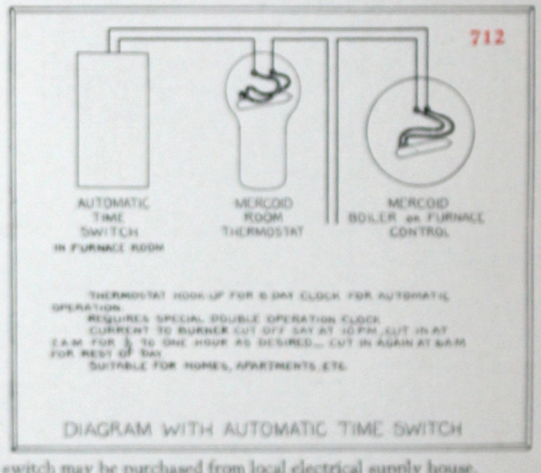
THE simplicity of the Mercoid system of 2-wire direct control is fully recognized. There are no confusing or intricate wiring installations to be made. The hazards and expense of improper hookup are avoided.



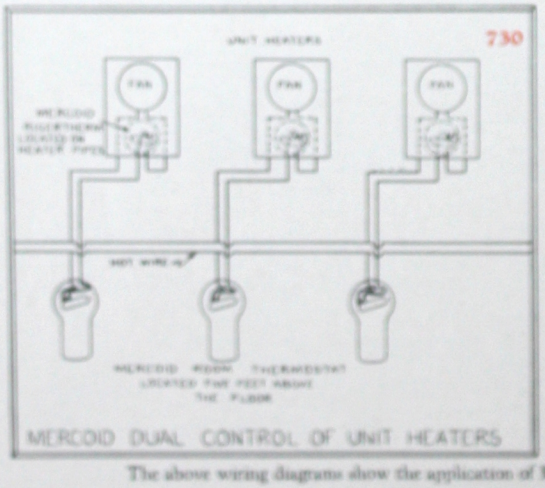


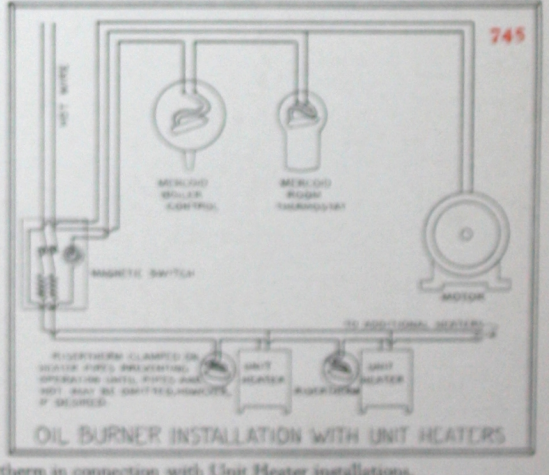
The diagram to the left is a hookup showing the use of Mercoid Panel Unit SDEG. The diagram to the right is connection with the use of Mercoid Figure M-51 and Figure 50.





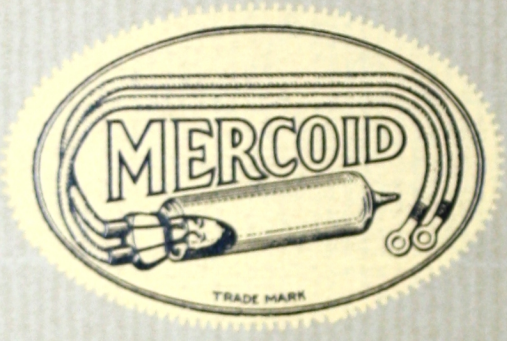
Suggested methods for hookup of time switch and thermostat. Standard time switch may be purchased from local electrical supply house.





The above wiring diagrams show the application of Mercoid Riserthern in connection with Unit Heater installations.

CHARLES A. LANGE CO.
CHICAGO


MERCOID
TRADE MARK